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ORIGINAL ARTICLES.

A NEW AND IMPROVED METHOD OF ENTERING THE ABDOMINAL CAVITY IN THE ILEOCECAL REGION, WITH SPECIAL REFERENCE TO THE REMOVAL OF THE VERMIFORM APPENDIX.[1]

BY GEORGE R. FOWLER, M.D.,

OF NEW YORK;

PROFESSOR OF SURGERY IN THE NEW YORK POLYCLINIC, SURGEON TO THE METHODIST EPISCOPAL HOSPITAL, ETC.

IN selecting the site and method of the abdominal incision in operative attacks upon appendicular lesions, or surgical conditions which may simulate the latter, two cardinal points must be borne in mind: First, the parts within the abdomen involved in the intended operation should be brought readily within reach. Second, weakening of the wall of the abdomen must be avoided as much as possible by carrying the incision through the latter, whenever practicable, in the direction of the fibers of those structures upon which mainly depend the function of the abdominal wall in resisting intra-abdominal pressure.

The incision in all cases of appendicitis should be so planned as to include removal of the appendix. In order to accomplish this with ease and celerity the technic demands free access to the base of the organ. or its point of junction with the cecum.

Opinions differ somewhat as to the surface relations and clinical anatomy of the appendix vermiformis. The cecum, in certain exceptional instances, may be located at points distant from its normal location in the right iliac region, but, when normally situated, the relation of this portion of the large intestine as a whole to a fixed point upon the abdominal wall is fairly constant. Attempts to arbitrarily fix the exact location of the base of the appendix in its relation to the anterior abdominal wall, however, have proved futile for several reasons, among which may be mentioned the existence of varying points of attachment to the cecum in different individuals, variations in the width of the cecum, conditions of distention on the one hand and relative collapse of the intestine on the other, and, finally, to the mobility of this part of the large intestine as governed by its peritoneal anchorage. A true mesocecum is very seldom observed.

In my own experience ready access to the base of the organ is secured in the largest number of cases through an incision so planned that its center strikes a point corresponding to the intersection of a line extending from one anterior superior spinous process of the ilium to the other, with a vertical line drawn half-way between the median line and the right anterior superior spine. This differs somewhat from Clado's point, this observer placing the vertical line upon the outer edge of the right rectus abdominis muscle and locating the base of the appendix at the intersection of this with a line connecting the iliac spines. The varying width of the rectus muscle and the difficulty of locating this structure in individuals with a thick layer of fat in the abdominal wall constitutes a valid objection to the use of this as a surface guide. While the base of the appendix may be sometimes found as high as McBurney's point, in my own experience it has been most frequently located at the point I have indicated.

As to the second point: The abdominal wall is made up of structures whose functions in resisting intra-abdominal pressure vary greatly. For instance, the skin, fat, planes of superficial and deep fascia and the peritoneum, singly or combined, contribute but a small portion of the force-resisting qualities necessary to insure stability of the wall. For this we must look to the muscular structures and their aponeurotic expansions, and of these the latter are of the greatest importance. To conserve the integrity of these structures is, therefore, of the highest importance, and, following the rule, section of these should be made in the direction of their fibers in order to favor rapid repair and avoid as far as possible the presence of cicatricial tissue. Of the structures under consideration the most important in this region is that known as the aponeurosis of the external oblique. The importance of preserving intact this structure cannot be overestimated, inasmuch as failure of its incised edges to unite leads to bulging forward of the underlying muscle and the final occurrence of surgical hernia.

The next most important structure is the internal oblique and its tendinous prolongations The part of the internal oblique which concerns us most is that portion which arises from the middle third of its origin from the crest of the

[1] A portion of a paper read, with stereopticon illustrations, before the Associated Physicians of Long Island, at the annual meeting of that body, held at Garden City, June 24, 1899. The material comprising the paper, together with the cuts made from the drawings used for making the lantern slides, and of which the illustrations in this article are electrotype reproductions, was incorporated in the chapter upon operative treatment in the forthcoming new edition of my book upon Appendicitis. The material was placed in the hands of the publishers, but a disastrous fire destroyed the firm's plant, and for a time it was feared that my manuscript had also been destroyed. The latter was finally recovered from the ruins, but the delay incident to the fire has prevented the prompt issuing of the book. The simultaneous publication of Dr. Willy Meyer's article in the *Journal of the American Medical Association*, and that of Professor Weir in the MEDICAL NEWS, under date of February 17, 1900, has prompted me to publish at this time the method which I have employed for several years past and repeatedly demonstrated to the classes at the New York Polyclinic, as well as to those attending my other hospital clinics.

ilium, the fibers of which pass obliquely upward and inward and terminate in an aponeurosis which divides at the linea semilunaris in such a manner as to embrace the rectus muscle, continuing forward and finally to the linea alba.

The transversalis muscle, the most internal of the flat muscles of the abdomen, is placed immediately beneath the internal oblique, its fibers, as its name indicates, passing almost in a horizontal direction. The portion of this muscle which is involved in an incision designed to reach the contents of the iliac region is its upper three-fourths, where its aponeurotic expansion to the linea alba passes behind the rectus, blending with that of the internal oblique to form the posterior lamella of the sheath of the rectus muscle.

Finally, the rectus muscle is to be considered. This structure is of importance mainly because of its function in assisting in controlling the effects of intra-abdominal pressure. Its importance as a surface guide is greatly overrated. In my experience the proportionate width of the muscle varies considerably. That portion which is of especial interest in our present study occupies anywhere from one-third to one-half of the anterior portion of the space located between the median line and the anterior superior spine of the ilium. Its principal interest in the present connection rests in the fact that its sheath is made up of the divided aponeurosis of the internal oblique, this being reinforced by the strong aponeurosis of the external oblique anteriorly, and the tendinous expansion of the transversalis posteriorly, the point where these join before enveloping the muscle constituting the linea semilunaris.

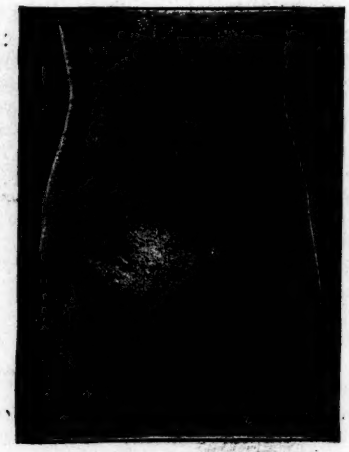
A glance at the nerve and blood supply of this portion of the abdominal wall will be of interest in selecting the site and direction of the incision in operating for appendicular lesions. The eleventh and twelfth intercostal nerves are distributed to the muscles of the abdomen. The last named is so placed as to be crossed by almost all of the usually employed appendicitis incisions. The first named crosses the linea semilunaris in a position to be injured in case it became necessary to extend the original incision in an upward direction in exploration of the region of the gall-bladder. These two nerves constitute the motor supply to the abdominal muscles. The ileo-inguinal and ileohypogastric branches of the lumbar plexus are regarded as purely sensory nerves. The first named, however, sends a filament to the internal oblique. Should the exigencies of the case likewise demand extension of the incision in the direction of the pelvic viscera, the ileo-inguinal branch would be more than likely to be divided.

These branches of the lumbar plexus pass from behind forward upon the transversalis muscle, between the latter and the internal oblique. The nerve structure of special importance in our present study is the twelfth intercostal. This passes from behind forward upon the anterior abdominal wall on a level with the lower margin of the umbilicus, where it describes a gentle curve forward and downward piercing the rectus muscle.

The twelfth intercostal nerve is accompanied by a branch of the twelfth intercostal artery, which is frequently encountered. The deep epigastric branch of the external iliac artery also lies upon the transversalis muscle in this region. It ascends vertically behind and just within the outer edge of the rectus muscle, accompanied by its venæ comites. The efferent branches of the latter join the veins at a more or less acute angle and, unless care is exercised, are apt to be injured in an incision placed parallel with and at the outer edge of the rectus.

Having thus briefly stated the anatomical points upon which may be based an ideal incision for gaining access to the ileocecal region, permit me to bring to your notice a new operative method particularly devised for cases of appendicitis operated upon early in the attack and while the infection is confined to the appendix itself, and for cases in which the operation is performed after the attack, sometimes erroneously called "between the attacks." It may likewise be employed in cases in which the infection is not widespread, for exploring the pelvic organs in the female, and for other operative attacks upon the contents of the ileocecal region. The operation is based upon the same principles as the intermuscular incision of Dr. McBurney, this being, in its turn, based upon the anatomical points just stated. The operation about to be described, differs, however, from that of McBurney in that it gives readier access to the contents of the ileocecal region, and a larger working space of the intra-abdominal manipulation without increase in the size of the external incision. As the incision is carried through the structures of the abdominal wall the most important of the latter are divided in the direction of their fibers, and the important nerves and vessels are avoided, thus inflicting the minimum amount of damage and encouraging rapid repair. As further advantages may be

Fig. 1.



The incision in the skin.

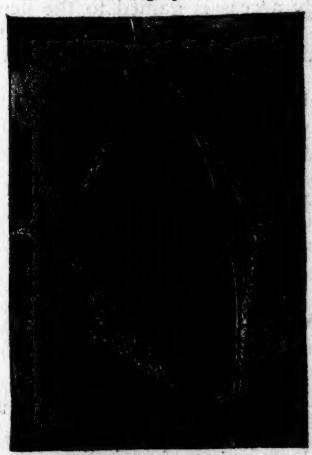
stated the relations of the three lines of suturing in closing the abdominal wound, and the fact that in suturing the long transverse incision extended beneath the rectus muscle, which really constitutes the important feature of the operation so far as gaining access to the appendicular region is concerned, this portion of the line of union is well protected by the overlying muscle.

Fig. 2.

The triangular-shaped flap reflected downward and outward, and retractors applied. The dotted line shows the site of the incision in the aponeurosis of the external oblique.

The Skin Incision.—The incision commences at the upper rounded prominence of the anterior superior spinous process of the ilium, is carried almost horizontally to the outer edge of the rectus abdominis muscle, from which point it is curved downward and extended parallel with the edge of the rectus for a distance of two and a half inches, or more, as required by the exigencies of the case (Fig. 1). The skin, fat and fascia are divided and the triangular-shaped flap with rounded corner dissected and reflected downward and outward, exposing the aponeurosis of the external oblique.

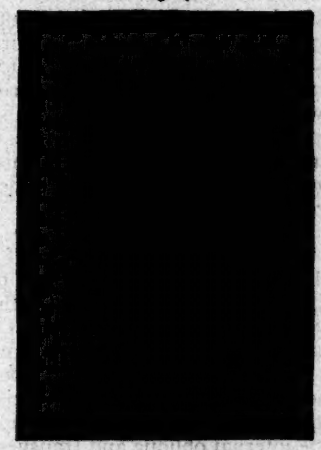
Fig. 3.



The internal oblique exposed, together with a portion of the sheath of the rectus muscle. The dotted line shows the site of the incision for opening the anterior lamella of the sheath of the rectus.

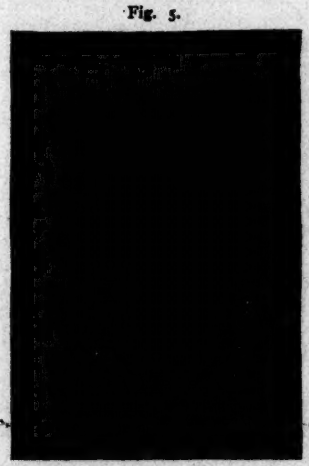
The Incision of the Aponeurosis of the External Oblique.—A retractor is applied at the lower angle of the wound and another at the middle of the horizontal incision. Traction upon these in the direction of the course taken by the external oblique exposes the latter for a distance of three or more inches, if necessary (Fig. 2). This structure is divided in the direction of its fibers to the extent of its exposed portion, two more retractors applied, as shown in figure 3, and the sheath of the rectus exposed and likewise opened. The rectus muscle and the underlying deep epigastric artery and veins are now retracted strongly toward the median line, the outer edge of the incised aponeu-

Fig. 4.



The outer edge of the incised external oblique retracted in an outward direction, and the rectus, together with the deep epigastric artery and veins displaced toward the median line. The dotted line shows the site of the incision entering the abdominal cavity.

Fig. 5.



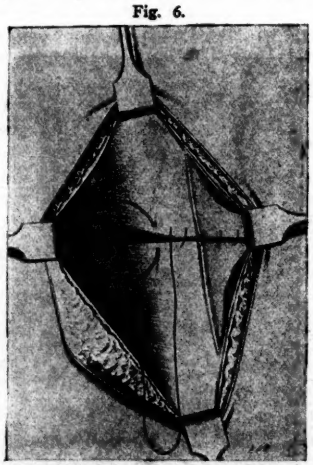
All of the layers retracted and the cecum exposed.

rosis being retracted in the opposite direction (Fig. 4). A space of four inches in its transverse diameter is thus exposed.

The Incision of the Internal Oblique, Transversalis Muscle and Fascia, and Peritoneum.—With the rectus well displaced toward the median line, care being taken to retract the deep epigastric artery and veins as well, and the outer edge of the incised external oblique aponeurosis retracted in an outward direction, the following parts are exposed: In the outer two-thirds of the space between the retractors is to be seen the muscular portion of the internal oblique, this terminating in the aponeurotic portion of this muscle at the point where the aponeurosis divides to enclose the rectus (the linea semilunaris). The inner third includes that portion of the exposed space left by the inward displacement of the rectus muscle, and is occupied by the posterior lamella of the sheath of the latter. In this space the transverse incision is to be made (Fig. 4). For the purposes of this operation the remaining structures of the abdominal wall may be considered as one layer, and the transverse incision carried directly through these in the direction of the fibers of the internal oblique and transversalis into the peritoneal cavity. The incision is commenced at the inner end of the space beneath the rectus muscle and access gained to the cavity of the peritoneum at this point first; after which, with the finger as a guide the section is completed. Retraction of the edges of the transverse incision will be found to give free and ready access to the region of the cecum (Fig. 5).

At the completion of the operation the parts are to be replaced and sutured. The transverse

Fig. 6.



Closing the transverse incision.

incision is closed by a running catgut suture including all of its layers. In closing the incision in the external oblique aponeurosis care must be taken to include in the suture the incised edge of the sheath of the rectus muscle (Fig. 7). The muscular structure itself should not be included in the suture since the interposition of this between the incised edges of the sheath, which may follow the attempts to include the muscle, will prevent prompt union of the aponeurosis.

In view of the supreme importance of securing immediate, firm and permanent union of the aponeurosis of the external oblique it is best to em-

Fig. 7.

Closing the incision in the aponeurosis of the external oblique. The position of the needle shows the method of including the incised edge of the sheath of the rectus in the suturing.

ploy kangaroo tendon for the suture material in the case of this structure at least. Finally, the skin wound is to be closed. This may be done by the ordinary interrupted suture, although this, as all skin incisions, is best closed by the subcuticular suture.

The advantages claimed for this method of operating are as follows:

1. Ready access is gained to the ileocecal region, and ample room secured for all necessary manipulation in the class of cases for which it is designed.

2. Weakening of the abdominal wall and the liability to surgical hernia are reduced to the minimum by (*a*) incising the important musculo-aponeurotic structures in such a manner as to secure immediate, firm and permanent union; and (*b*) avoiding injury to the vascular and nerve supply of the parts involved in the incisions.

AGAIN THE QUESTION OF CANCER.[1]

BY ROSWELL PARK, A.M., M.D.,
OF BUFFALO;
PROFESSOR OF SURGERY IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF BUFFALO.

IF one may rely upon medical journals both at home and abroad as fair indices, the problem which most perplexes and interests the medical world to-day is still that of cancer. This must be my excuse for again bringing this subject before you. No better proof of this can be given than the timely appearance of the "Cancer

[1] Read before the Medical Society of the State of New York, Albany, January 31, 1900.

Number" of the *Practitioner*, for April of last year, which aroused the greatest interest all over the world. A year ago I read before this Society a paper on this same subject in which, among other things, I dealt with figures and statistics. The figures themselves were taken from official sources, and, consequently, must stand. Certain conclusions which were drawn from them were challenged. Without permitting myself to be drawn into any controversy upon this aspect of the subject, I simply want to say that such conclusions are purely a matter of interpretation, and that in such deductions a personal element must always largely enter. I put upon them the interpretation which it seemed to me they deserved, with which, however, a few others could not agree. Nevertheless, such as they were, they have been unexpectedly corroborated and confirmed in a general way by writers at home and abroad, all of whom have studied the matter independently. This would-be correspondent of the *Lancet*, making comments upon my paper, drew forth from the editors of that journal a very positive sort of statement, which read as follows: "We may point out as a fact of some importance that Dr. Park's conclusion concerning the recent terrible increase of cancer and the concurrent decrease of tuberculosis in the United States tallies singularly with the experience of this country, and we are surprised that our correspondent, who is avowedly conversant with the literature of the subject, has omitted to notice our own observations to this effect in the *Lancet* of April 22nd, page 1111, and May 20th, page 1376, of the current year. It will thus be seen that in both cases the tendency of English national statistics is to confirm American experience as set forth in Dr. Park's article in the *Practitioner*."

To go minutely into this subject requires that kind of study of figures and of maps which can only be satisfactorily given at the desk, and it is not my purpose at this time to go into intricacies of this kind. I am perfectly willing, however, to reiterate the essential conclusion which I have repeatedly uttered and published, namely, that cancer as a disease is certainly upon the increase, and that the matter of its *rate* of increase is subsidiary to this principal fact.

When voicing this opinion, as I often have to, I have been frequently asked, "Is not this to be accounted for by improvements in diagnosis?" And some are so sure that the reply to this should be affirmative that they dismiss the whole question with that satisfactory, self-given answer. Such reasoning is, however, fallacious. It is true that improved methods of diagnosis prevail and the disease is now recognized as formerly it was not. It is also true that certain lesions formerly considered cancer are not so considered now; actinomycosis, for instance, and other of the infectious granulomata. This, to be sure, will exclude only a certain small percentage of cases. But one feature of this matter I have never yet seen alluded to in print, and this is that just in proportion as diagnostic methods are improved and operations attempted earlier, just in that proportion do we get actual cures and save these patients from dying of the disease. If, therefore, such improvements be regarded as they should be, it will appear that mortality rates are being actually reduced as compared with the real number of cases. To me this means a great deal, and I do not hesitate to say that it should be a matter of pride with the surgical profession that they may be able to reduce the death-rate, while, nevertheless, the disease rate is slowly creeping up. More important, then, than to study the deaths is to note the number of actual cases of cancer occurring, and I believe that the experience of every surgeon living will tally with my own in this regard.

Aside from the English statistics which I have elsewhere alluded to, which show unmistakable increase in the cancer rate, Verneuil, in 1893, admitted a progressive increase which he determined from a comparison of statistics of succeeding years; while Fabre, in Lyons, writing in 1892, came to exactly the same conclusion.

Concerning the contagiousness or infectiousness of cancer, we have now a number of studies from which it may be determined that in certain limited localities cancer assumes at times an endemic form. Guelliot, and Shattuck and Balance have described it in certain streets; Lucas-Championniere has seen it in villages, Arnaudet has described it in a small *commune* in Normandie, where he seems inclined to ascribe it to the cider which the inhabitants drink and which they do not manufacture in a hygienic way. Fiessinger is disposed to ascribe cancer to some parasite deposited by the bites of certain aquatic insects, while Haviland's views are now quite well-known, as well as those of Noel, who finds cancer in man most common in those localities where cancers in trees are likewise common.

A most cogent plea for collective investigation of cancer has been recently published by Katz[1] of Hamburg. He calls attention to the unsatisfactory explanation afforded by many of the theories now in vogue, and argues logically and convincingly in favor of the method by concerted investigation, and particularly the statistical method. It was Mars d'Espine who perhaps set us our first example in the direction of statistical study, when he reported the statistics for thirteen years in the Canton of Geneva, a careful study which has not yet found a sufficient number of imitators. The special interest of Katz's paper at present for us is the corroboration which his own studies afforded of the statement which I have so frequently made that there is every reason to think that cancer, as a disease, is upon the increase. Katz shows, for instance, from a study of Hamburg conditions, the experience of private practice and the mortuary as well as pathological statistics of the General Hospital there, as well as by the studies of E. Fraenkel, that in that city, especially, there is a well-marked increase in the percentage of cancer. Moreover this statement is accentuated by statistics from all over the

world, which seem to show that not only is the disease upon the increase, but that the age of liability is becoming younger, and that it is rather the better classes of people than the lower in whom it seems to predominate. Katz concludes his paper by a recognition of the difficulty of collective investigation, and at the same time by a statement that it is of the greatest importance that it should be undertaken.

A topographical study of the disease will render great aid in solving some of its mysteries. As classical models for such study we may refer to Power's paper on "The Local Distribution of Cancer and Cancer Houses," in the April (1899) number of the *Practitioner*, the studies contained in the *British Medical Journal*, before July 1, 1899, with the editorial comments thereon, and the paper by Lloyd Jones on "The Topographical Distribution of Cancer," in the *British Medical Journal*, for April 1, 1899.

What could be more accurate, in such work, than Jones' method, which he describes as follows: "Having obtained the list of houses in which persons had been taken ill with cancer, I proceeded to visit the houses and to mark each one on an ordnance map—scale of ten feet to a mile—showing the affected and the non-affected houses in red and black respectively. This map of the borough showed at once that certain districts were fairly free from cancer, while other regions were far more extensively affected. The areas most affected of all showed 1 case in every 2 to 5 houses; the most healthy areas, from this point of view, showed only one case (or no case) in every 60 houses."

The figures obtained were as follows: Total number of houses concerned, 5685; unaffected houses, 5247; affected houses, 438; showing a mean of 1 affected house to every 11.9 unaffected houses. Multiple cases in the same house divisible into: (1) Double cases, 7; (2) triple cases 3.

But as showing what can be accomplished in rural districts in this same line of work, if only the necessary zeal and intelligence be applied to it, take the following illustration furnished me by Dr. John E. Sutton of Albion, Orleans county. He writes me: "During the last five years, or so, there have occurred from all causes, within a range of 1⅛ miles of a small hamlet near Albion, N. Y. (Rich's Corners), sixteen deaths. Of these nine were unquestionably from cancer; two were probably caused by cancer, judging from the history of the cases as learned from the friends. Of the remaining five one died of a pistol-shot wound, leaving four of the sixteen as dying of disease other than cancer. There are at present two cases living in the territory mentioned; one of them I operated on a year ago, without recurrence as yet; the other is beyond help." This letter is accompanied by a drawing which makes plainer yet the facts therein stated. I wish that this report of Dr. Sutton's might stimulate many others to similar study and report.

Lloyd Jones, in his paper above referred to, has summarized the views of various observers so succinctly that I reproduce a brief portion of it here: "Briefly, the following are the points which, in each case, several of the most trustworthy authors agree: 1. That cancer picks out certain districts, and that there are areas of immunity and cancerous areas (Shattuck, Noel, Gueilliot, Behla). 2. That immune areas may lie close beside cancerous areas (Pfeiffer, Noel). 3. That malignant disease is most common along the banks of rivers or streams (Pfeiffer, Haviland, Fiessinger, Noel, Nason, Blake). 4. That elevated districts or plateaux are more free from cancer, while low-lying districts carry more liability to its inroads (Pfeiffer, Noel, Haviland, Fiessinger, Nason). 5. That isolated 'cancer houses' or groups of such houses occur in certain districts (Pfeiffer, Fiessinger, D'Arcy Power, Scott, Chapman, Noel, Ogle, Guelliot). 6. That cancer houses often occur near to woods (Fiessinger, Noel), orchards (Fiessinger) or forests of firs (Noel). 7. That persons living upon flooded and clay districts and retentive soils are especially liable to its ravages (Haviland, Butlin). 8. That limestone districts are comparatively free from cancer (Haviland) but do not confer absolute immunity (Butlin). 9. That cancer may be disseminated by means of water (Fiessinger, Noel, Haviland, etc.); that it depends upon the presence of decaying animal or vegetable matter or sewage (Havilan, Noel). 10. Lastly, the suggestion its thrown out by three observers that insects may play a part in the dissemination of malignant disease (Morau, Fiessinger, Noel). Of these three the first is the only one who adduces anything like proof of his assertions."

Durante and Conheim believe that tumors proceed from embryonal remains; Thiersch taught a lessened resistance of connective tissue to epithelial encroachment; Hansemann and Hauser hold to an altered cell condition which they speak of as *anaplasty*; while Fabre-Domergue also believes in certain vague cell changes or cytotrophic alterations; and Ribbert regards tumor formation as unwonted cell activity and the escape of certain cell-groups through proliferating connective tissue. All these statements, however, seem to be rather descriptions of certain facts observed at various times, and they still leave the real question of *why* these cells act as they do quite untouched. It seems quite fair to assume that as a preliminary to cancer formation we must assume a certain *predisposition* of tissues, which may be general or local, inherited or acquired. This is no more than we fully believe to obtain in other diseases to which cancer shows more or less analogy. We see what local predisposition may do under conditions of chronic irritation where we have cancer following chronic eczema, catarrh, ulcers, scar formation, or gall-stone, diseased teeth, mucous patches or other syphilitic lesions, or in the presence of such foreign bodies as clay pipes, soot, paraffin, etc. It is, indeed, now a question whether such irritants as enzymes may not contribute to cancer formation.

Again, in the way of local predisposition we see that nearly all cases of skin cancer occur on exposed parts of the body, face, hands, genitals or nipples; and when on other parts almost invariably on surfaces where there has been some such lesion, such as warts, eczema, sebaceous tumors, ulcers or scars. The only exception to this general statement is the hairy scalp, and yet this may be regarded as, in a sense, a well protected surface. Czerny[2] relates the case of a man whose foot he had to amputate for cancer which grew from the sole. This man had for many years, while a boy, worn a seton in the foot for the purpose of preventing goiter, in accordance with local superstition. It did not protect him from the goiter, which he acquired, and did cause the loss of his foot. If now Ribbert's views concerning disturbed epithelium and anaplasty are correct, why should it have taken twenty years to begin to form a cancer in this case?

Cancer is virtually never seen on the skin of the back save at points which are within easy reach of the hands. When it appears upon the face it is nearly always on those who do not use soap. The exemption of women from cancer of the lip is largely due to the fact that they do not smoke, and that their teeth when diseased fall out much easier and earlier than do men's. Indeed, Czerny's experience is that cancer of the lip is the only kind which is becoming less frequent, and that this is because pipe-smoking is perhaps less the custom, and the people are learning to take better care of their teeth. Cancer of the tongue is also found almost solely in men, because smoking, bad teeth and syphilis of the mouth mostly prevail in the male sex. Cancer of the ear begins nearly always on the upper and outer border, *i.e.*, the least resisting and most often irritated part, as by injury, frost-bite, etc., or else in those recesses which are hardest to clean. Cancer of the upper alimentary tract occurs by far most often at the site of previous lesions or irritations, *i.e.*, scars, fissures, etc. In the stomach and bowel we know that it is often preceded by ulcers. After food has been in one sense sterilized by gastric juice, bile and pancreatic fluid it seldom carries cancer germs, and primary cancer of the small intestine is a great rarity. In the ileocecal region and the colon it becomes common again, and here it is especially that stagnation of the fecal current permits it.

Particularly about the breast and nipple, where chronic mastitis, subinvolution, and ulcers or fissures furnish the local predisposition, do we meet with cancer. Here, also, inherited cell proclivities may play a large rôle. But to external influences must be assigned the major rôle, as well as to such lesions as eczema or intertrigo of overhanging mammæ, or the pressure of corsets. So, too, with cancer of the uterus. Chronic tissue changes furnish the site for most of these lesions, and especially scar tissue, ectropion of mucosa, etc., while cancer of the endometrium is apparently inseparable from catarrhal lesions, placental relics or diseases, etc. Even submucous myomata are accused of giving rise to cancer. The apparently prophylactic effect of circumcision is well known, since Jews relatively seldom get syphilis or cancer of the penis, but gonorrhea often. Cancer of duct glands is relatively common as compared with those of the so-called ductless glands, which latter suffer much oftener from endothelioma and angiosarcoma. The lungs, bones and lymph nodes are practically exempt from primary carcinoma, although not from sarcoma. Summarized, carcinoma takes its origin almost always at those places where chronic tissue alterations or scars have caused local changes which we may fairly regard as constituting a predisposition, or where retention of secretion or contents have produced the same effect.

While all this cannot be said for sarcoma, certain other features stand out predominantly, and are equally significant. For instance, we know other infectious diseases which produce tumors absolutely analogous to sarcomata, even in the possibility of their spontaneous retrocession. Syphilomata, *e.g.*, sometimes bear such a close resemblance to sarcomata that Esmarch was even tempted to think that the latter might have a syphilitic origin. We know, also, how long actinomycotic tumors were regarded as sarcomata. Ulcerating tuberculoma may also be easily and often confused with sarcoma. To this list we may well add Hodgkins' disease, leprosy, lymphosarcoma, certain phlegmons due mainly to streptococcus invasion, or to the micrococcus tetragenus, elephantiasis, rhinoscleroma, rhinophyma and certain skin lesions called by the dermatologists sarcosis cutis, lymphodermia, etc.

It is manifestly impossible to draw any sharp distinction between the true tumors and numerous other infectious lesions, whose parasitic origin is not now denied. We must, moreover, never lose sight of the analogies offered from the vegetable kingdom, where practically all xylomata or three-cancers (many of which are fatal to the trees) are due to invasion of parasites either before or after traumatism of some kind, even such as frost and ice may produce. We must remember that sarcoma of bone, like osteomyelitis, may be apparently produced after injury or exposure, and we can then view it only as the expression of the localized action of some parasite circulating with the blood, and setting up disturbance at the point of least resistance.

Autoinfection with cancer is by no means so rare. Implantation cancer of one labium from the other is not uncommon, and the vagina is not infrequently infected from the os. When colloid, abdominal and ovarian cancers were more frequently tapped than now implantation along the trocar tract was frequently seen. How often we see secondary cancer along the line of incision made for removal of the primary lesion, infected at the time. Czerny says that when asked if cancer is communicable he replies, "Perhaps not; nevertheless, best use extreme caution, destroy the dressings with fire, sterilize the clothing, and avoid common use of utensils, beds, etc." Czerny

relates the case of a woman afflicted with breast cancer who was disposed to attribute it to wearing a corset previously used by an aunt who had died of the same disease.

In the middle of the last century cancer patients were not accepted in numerous hospitals. Because of this fact, Godinot, a priest in Rheims, erected a special asylum for them. But his neighbors protested against such a "pest-house" inside the city, and so he had to remove them in 1778 to a place outside. Not until 1841 were they again received into the Hotel Dieu, and even then they were isolated.[3] Instances must be known to many of you, as they certainly are to me, of various members of the same family, in one house, succumbing one after another to cancer. I have elsewhere called attention to Behla's remarkable study of endemic cancer in the little town of Lückau. There is no doubt but that many fungi can produce certain enzymes which have the power of exciting both cell proliferation and degeneration. So, too, Bejerinck, for example, has found that the juice pressed out from the larvæ of those insects which produce galls in trees has the same power of exciting proliferation of plant cells as have the larvæ themselves.[4]

Czerny and others have recently again raised the question as to the possibility of spontaneous retrocession of malignant tumors. This is a rare phenomenon in which I thoroughly believe, and to which I propose at some later time to devote special time and study. At present I am anxious to obtain data of carefully observed cases, and solicit your aid in securing them. Believing in it, as I am compelled to do, there comes up at once the query, how many cases of improvement after employment of erysipelas toxins or after exploratory operations may be due to it alone?

As already mentioned in speaking of Katz's paper, the number of cases of cancer appearing at what may be called precocious age is being constantly augmented by published instances. For instance, Dufour[5] has reported an epithelial cancer of the larynx in an infant of eight months; Czerny,[6] cancer of the kidney in a child of three and a half years; Kahn,[7] a case of pancreas in a child of two years; Reboul,[8] cancer of the testicle in a child of six and a half; Ganghofner,[9] cancer of the uterus in a girl of eight; Rosenstein, same in a girl of two; Krasnohoff,[10] epithelioma of the lip and nose in a child of eight years; I have seen the same thing in a woman of eighteen; Mariage,[11] carcinoma of the ovary in a girl of eight; Deschamps,[12] cancer of the liver in a child of eleven years; Moore,[13] cancer of the stomach in a child of thirteen; Scheffer,[14] another in a child of fourteen; Hirtz and Lesne,[15] epithelioma of the stomach in a youth of nineteen; and Gangolphe,[16] epithelioma of the lip in a child of 15 years. From other sources I gather the following also: Finlayson[17] has recently reported sarcoma of the stomach in a boy of three and a half years; Scholtz, carcinoma of stomach in a girl of twenty-two; Scheffer, same in a boy of fourteen; Hoffman saw it in a twenty-year-old soldier; Reinbrecht, in a twenty-one-year-old girl; Muth, in a twenty-four-year-old man, and Burger's statistics of 357 cases of gastric carcinoma gave 11 patients under thirty; Olshausen[18] relates cases of ovarian carcinoma in girls aged respectively twelve, nineteen, twenty-one, twenty-three and twenty-nine years. Leopold has had similar experience. Phocas[19] reports 5 cases of ovarian cancer in girls from seven to fifteen. Schröder[20] gives 33 cases of uterine cancer below age of 30 out of 2265 collected, and 22 out of 492 cases that came to autopsy. I have myself seen advanced and hopeless adenocarcinoma of both breasts in a young married woman of twenty-one. Haycock and Bryant have each seen one breast involved in women of twenty-one. In the Greifswald clinic, of 64 breast cancers removed in the last five years two were from patients under twenty-six. Ludlow and Lebert collected 51 cases of cancer of the testicle, of which 5 occurred in boys under five, 1 in a lad of fifteen, and in 11 others the patients had not reached thirty. Some, at least, of these must have been sarcoma.

I have seen sarcoma of the rectum in a patient of seventeen. Marchand has reported rectal carcinoma in a girl of sixteen and Cripps in a boy of seventeen. Billroth saw three cases of intestinal cancer between ages of eighteen and twenty, and Raspe has recorded a case of rectal cancer at age of twenty-eight. Von Bary has described a rectal cancer springing from an ulcus durum at the verge of the anus. Rose and Socin have both operated for rectal or colon cancer at ages of twenty-six and twenty-seven. Cumston[21] has collected several other cases of this same nature and has also reported carcinoma of the liver in a girl of nineteen, cancer of the cervix in a woman of twenty-eight, and rectal carcinoma in a young man of twenty-four. Fabre-Domergue has described an enormous, inoperable epithelioma of the thigh in a man of thirty. Socin operated in 1890 on a woman of twenty-eight for carcinoma of the vulva; Weinlechner on a man of twenty-four for epithelioma of the penis and Rose on a man of thirty for the same condition. It has happened to me to see an unmistakable epithelioma of the penis in a man a little under thirty.

It is never possible to get away from that question of fundamental importance, what is the cause of cancer? Realizing the futility of purely personal effort in the solution of so large a problem, legislative aid was invited and finally secured. By means of this a laboratory has been well equipped and manned for the purpose. This laboratory has been organized in order to study all that the problem includes, and in the broadest possible way. It is not committed to any particular view nor based upon a single idea. As the originator of that laboratory I wish to emphasize that my own papers on the subject, including this one, are not to be considered as anything more than my own personal views, save when so specified. When Dr. Gaylord thinks the time has come to publish the results of his investigations, and

those of his co-laborers, then we may be said—as an institution—to stand committed to whatever views are at that time expressed. For myself, I have not hesitated to espouse the parasitic theory, for many years, and can only see in the labors of others, including those of my colleagues in the State Laboratory, constantly increasing confirmation of my beliefs. Yet these views are as largely the result of clinical as of pathological study.

The parasitic theory in explanation of cancer is that which is to-day most vehemently discussed. It is, however, far from new, for without going back to the views of ancient writers, Harvey[22] wrote that tumors resemble strongly those parasitic productions which we see in the vegetable kingdom, while John Hunter thought that cancer was caused by the presence of an entozoon, and Adams regarded an animal parasite as undoubtedly the cause of cancer. Of late, however, it has taken more particular form and shape, and is being tested by all the canons of modern scientific criticism. Enthusiasts, working under the inspiration of this theory, are easily tempted, however, to lose sight of the tumor side of the question while hunting for the parasite. I have elsewhere gone rather minutely into the arguments which may be advanced in favor of this theory, and, consequently, may be excused in this place from repeating them all. I would say, however, that it is not a question of any one parasite, nor at first whether these hypothetical parasites belong to the animal or to the vegetable kingdom. The primary question is whether cancer is due to intrinsic or extrinsic causes. Those who hold to the views recently enunciated by Ribbert may need again to be reminded of that to which Virchow called attention in his London address, namely, that to endow epithelial cells with all the properties and activities which his theory calls for is to credit them with much greater power than they possess upon their parent soil. It would seem that is is yet to be established that epithelium, leaving its own proper home and migrating, can acquire such enhanced activities as Ribbert would suppose.

Malignant tumors certainly constitute a morbid group which may be regarded as having strong family resemblances, and yet it is quite impossible to suppose that if of parasitic origin a single parasite should be solely at fault. One cannot imagine that epithelioma of the lip and sarcoma of bone-marrow are necessarily due to the same parasite. Here again, as so many times, we find a strong analogy between cancer and the infectious diseases. Suppuration, for instance, we know may be produced by any one of numerous organisms. We acknowledge its parasitic explanation while at the same time appreciating this fact. I want it to be emphasized that in all my own writings upon this subject I have never for a moment asserted all forms of cancer to be due to a single parasite, but believe that there are several, perhaps numerous organisms, which may produce this condition under favorable circumstances. If this be correct, we must first establish the general nature of the process and later try to identify the organism at fault.

When the State of New York by appropriation established a laboratory for the investigation of cancer it devolved upon those who had charge of the work to elaborate a rational plan by which the subject could be properly approached. Necessarily, the first steps in such an investigation had to be taken along conventional lines, and so extensive and yet scattered has been the work of various investigators of the subject that it has required a considerable period of time and no small amount of effort to thoroughly collect and classify the material at hand. It was decided in the beginning that the subject must be as much as possible approached from all sides, but the limitations of our appropriation have thus far rendered it only possible to carry out an elaborate pathological and bacteriological research. From the beginning the plan has been to add to these two sides of the question a complete and full investigation along chemical lines. Aside from the fact that our present quarters and appropriation have thus far not permitted our undertaking this third branch, the proper man was not apparent, and it is only within a few months that such a scientist has been obtainable. In making to you a short report of the amount of work which has been accomplished, I wish to particularly emphasize that much of the work which may at first glance not appear of great importance has been none the less necessary, and has required as great care and precision as work which we are at present conducting and which gives promise of much that is positive. Pathological investigation has consisted in histological examination of tumors hardened by all of the approved and modern methods, stained after various formulæ of different investigators and scrutinized with great care for the purpose of ascertaining to what extent and how constant were the various forms which different investigators have wished to interpret as parasites. We may say in reviewing this portion of the work that early efforts showed that while all of the various appearances described could be found in certain specimens, no method gave constant results. Likewise, we have been able to determine to our own satisfaction that histological investigation alone will never determine the nature of certain suspicious bodies which are to be found in carcinoma. As Dr. Gaylord stated before this meeting a year ago, examination of fresh tumors gave us more encouraging results, and we were able to determine the presence in all carcinomata of certain bodies resembling fat, but which could not be dissolved in ether or other fat solvents. Various attempts to harden and stain these bodies had met with only partial success when we came into possession of an article published by H. G. Plimmer, in the "Cancer Number" of the *Practitioner*. Plimmer had investigated during a period of six years over 1100 carcinomata, and by a special staining method which in principle consists in

using a fat fixative, osmic acid, removing the same by oxidation with hydrogen peroxide, and staining with special reagents, has succeeded in demonstrating the presence in practically all carcinomata of certain characteristic bodies which we now are able to say are identical with those which had been observed by Dr. Gaylord in the fresh state. Plimmer's method furnishes further corroboration of the exceedingly close resemblance which these bodies in the fresh state bear to fat, and it is probable that the success of his method depends upon the fixation of fat-like substances which these bodies contain. Since employing Plimmer's method, Dr. Gaylord has been able to demonstrate in all carcinomata examined the characteristic appearances described by Plimmer. In many cases these bodies are very few in number and only prolonged search will disclose them. Plimmer reports some success in the cultivation of these organisms, and, although we have as yet been unable to obtain the organisms by culture, we are at present working upon an indirect method by which we hope we shall ultimately succeed in isolating the organisms in all cases where present. To indicate to you the fruitlessness of ordinary bacteriological research along old and classical lines, I will give you a short *résumé* of the large number of cultures which have been made in the State Laboratory from various tumors, and the results which these investigations show:

Number of tumors investigated bacteriologically, 42. Of these the results were as follows: Negative, 21; micrococci, 11; fungi, 1; contaminated, 9.

Number of cultures studied from these cases, 1226. (This does not include probably as many more, not recorded, but made and studied from cases ascertained later on not to be neoplasms, and cultures made and studied during the investigation of micro-organisms, especially yeasts and fungi not derived from tumors.) Average number of cultures from each case, 28. Sixty (60) different kinds of culture media were prepared and used in the investigation.

Total number of animals inoculated 118, as follows: (*a*) With fresh tumors, 46. Number of these dead, 32. Average duration of life, 78 days. (*b*) With fluids from fresh tumors or from localities (peritoneum, etc.) containing tumors, 22. Number of these dead, 22. Average duration of life, 73 days. (*c*) With cultures of micrococci or their products, obtained from tumors, 21. (*d*) With fungi, 10. (*e*) With tissues or fluids from animals previously inoculated, as above, 4. (*f*) New work on animals with yeasts, 15. Of which there are living, 9. Of which there are dead, 7.

Cases of tumors investigated histologically, 175. Cases worked out completely, 76. Cases for diagnosis alone, 99. Sections cut, stained and examined, over 2500. Blocks of tissue from animals, cut, 216. Sections examined, over 1200.

In analyzing these figures it will be seen, first, that the inoculation of animals with fresh tumors (46 times) has in no case resulted in the transplantation of carcinoma from man to animal; the animals have, however, in each case perished after an average period of time (78 days) showing symptoms of marked cachexia and with enlarged lymph nodes.

Our most recent work, by which we are introducing tumors into animals, employing another method, has resulted in the discovery of the fact that by the employment of proper staining methods the parasites found in cancer may be detected in large quantity in the enlarged lymph nodes of the experimental animal. This work is still in progress, and we are not prepared yet to publish it in full; but I wish merely to indicate to you the fact that even slight variation in technic may give totally negative or exceedingly positive results. In one case Dr. Gaylord succeeded in producing a true adenocarcinoma in an animal by inoculation with fluid from a soft cancer of the omentum. In this fluid was observed the presence of an organism which apparently belongs in the yeast group, and which we were unable to cultivate. The organism in the original fluid was injected into the jugular vein of a guinea-pig and after three weeks and a half the animal was killed; whereupon minute nodes of beginning adenocarcinoma of the lung were found. This is the first positive case of this kind, and holds out to us the definite hope that when we are able to understand the nature of these organisms we may be able to produce carcinoma in animals with organisms obtained from carcinoma in man. The laboratory is in possession of pathogenic yeasts which various investigators, Sanfelice, Plimmer, etc., have isolated from cancer, and we are now carrying on an elaborate investigation in the first steps of which we have been able to confirm all that Plimmer has published. The principal difficulty which we encounter at present is an entire lack of required knowledge on the part even of botanists of the nature of the organisms in question. These organisms are exceedingly polymorphic, and it requires prolonged experimentation to determine the relation between certain definite bodies found in the tissue, which are presumably these organisms, and the appearance of the same organism when grown upon artificial culture media. In this direction our recent experiments are rendering us great aid, and we have been able to confirm the identity of the bodies described by Plimmer and observed by ourselves in the fresh state, with the organisms which Plimmer has been able to cultivate. In his examination of 1100 tumors Plimmer has been able in only five cases to obtain a culture of the organism upon artificial culture media, indicating that the cultivability of the organism is exceedingly variable. Therefore, the large number of cases in which we have obtained negative results indicates nothing more than the fruitlessness of attempting to study organisms of unknown habitat by conventional methods. There are certain indications that the various forms of tumor are not produced by one

organisms, or even necessarily by one class of organisms. This fact I brought prominently before you a year ago, and to-day I am able to give you definite confirmation of the same, in that from one pigmented tumor we have a pure culture of an unknown fungus, which under certain conditions produces a pigment identical in appearance with the pigment found in the tumor. We have likewise been able by special methods to stain the elements of the organism in the tumor. The experimental portion of our work we are not yet prepared to report upon.

I am quite sure that you will appreciate the difficulties with which we are confronted in the investigation of a subject which has so far baffled science, especially as the organisms which we are forced to study because of their presence in certain tumors, belong to classes with which the pathologist and bacteriologist have as yet had nothing to do, and whose habitat and characteristics are unknown. Only by comparative investigation of all of the species which we are able to obtain, combined with elaborate experimentation upon animals, shall we be able to reach definite conclusions regarding the rôle which these organisms possibly play in the production of malignant neoplasms. Having exhausted conventional methods, we have now entered upon a new field of research, based upon the knowledge which we have been able to acquire of these organisms, and although this work has not been under way for a great period of time I am sure that we have already indications which lead us to believe that the difficulties are not insurmountable.

In this work we have endeavored—and have succeeded to a limited extent—to arouse the interest and cooperation of the veterinarians who come into contact with a large amount of interesting material. To the personal interest of Drs. Wende and Zinc of Buffalo, for instance, we are indebted for some very interesting specimens from animals. Such as these we are always anxious to secure, and, consequently, I would appeal through you to them so far as you have it in your power to spread this request for cooperation.

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Medical Societies Exempt.—A bill has been introduced into the New York Legislature exempting from taxation the property of medical societies in cities of the first class.

NOTES ON PLAGUE.

BY MAJOR H. E. DEANE,
OF CALCUTTA, INDIA;
ROYAL ARMY MEDICAL CORPS.

(Continued from p. 286.)

MY next opportunity occurred in the Bangalore epidemic of 1898-99. I personally treated between November 20, 1898, and February 15, 1899, 568 cases, with a mortality of 50 per cent. At first I had no previous experience to guide me, and had many bitter disappointments, due, I decided later, to my using much too small doses. I used cobra and Lachesis chiefly, and occasionally Crotalus, with six deaths—one case being plague rience, I stuck to the cobra, as easily procurable in this country, and I gave it hypodermically instead of by the mouth. The crude poison of the other snakes could not be obtained in this country, so I had no opportunity of trying larger doses than I already possessed. I treated the last nineteen consecutive cases chiefly with cobra venom from 1/500-1/1000 (solution of the poison in glycerine), in some cases using Lachesis or Crotalus, with six deaths—one case being plague pneumonia. I am acquainted with no such result in unselected cases with any other serum. The treatment may be considered as a serum therapy, the snake venoms being toxalbumins. Although a record in detail is beyond my limits here, I send you the notes. In future I should confine myself to the cobra, and use the rattlesnake in hemorrhagic cases, an instance of which I have never seen.

Case I.—Andaloo (female), age 9. Admitted December 24, 1898. Ill three days with fever, severe rigors, and pain and swelling in right axilla. On admission, temperature 101.2° F.; pulse, 116; respiration, 46. Drowsy; unable to sit up or stand. Tongue coated and red at tip and margins. For the next few days her temperature ranged from 99° to 104° F., pulse 100 to 132. The pain in bubo was very severe. On December 29th she had great difficulty in moving her head; buboes had appeared on both sides of the neck, which increased in size; difficulty in swallowing came on; the swelling increased in the axilla and was spreading down the right arm, with great tenderness of the arm. Up to this time she had been taking naja tripudians (cobra) internally.

On evening of 30th there was difficulty of breathing and swallowing, and I blistered the skin over the swelling on right side of neck (her head was fixed towards the left shoulder), and applied tincture of crotalus (1-1000) to the surface, and gave apis m. v every hour. The next morning the pain was much less, although there was no difference in the size of the swelling. Breathing was easier, and the child had not quite such a distressed look. The swelling of right arm had spread to the elbow and was very tender. Apis was continued every two hours. On December 31st, temperature rose to 104.2° F.; but the next day, January 1, 1899, she looked brighter than she had hitherto been, and there was no danger

as regards interference with breathing or swallowing. The cellulitis of the arm rapidly subsided. On January 3d, it was noted that the swelling was most marked over left angle of jaw. The further progress does not bear on any particular point. The right cervical bubo suppurated, and she was discharged February 14th, quite well.

This treatment seems to offer a great chance of success, and though all cases of plague do not call for it, I feel sure the cure of the fulminating cases will be found in this direction. I may mention that in many cases hyoscyamus has done wonders, and a case in this series will illustrate its action. Let me again emphasize the principle underlying the treatment, namely, a drug having a scientific connection with the patient's condition and then the single drug, alternated, if you like, with another singly administered drug; then and then only can one find out what does good and what does not.

Prevention.—I now come to the most difficult part of the subject, the prevention of the spread of plague. I shall confine myself to the means which have been adopted in India, with the results accruing therefrom. Nothing will be gained by inquiring into the preventive measures in the early centuries and the middle ages, as the results are obvious. During the epidemic mentioned as having existed in Cutch, 1812-1821, endeavors were made to stay the spread of the disease in the Ahmedabad district by preventing communication between infected and non-infected villages, and relations from a non-infected village were not even allowed to attend the funerals of those dying in an infected locality. Orders were issued that any inhabitants of a village who had visited an infected one was to be removed. The measures, however, did not stop the spread of the disease.

During the Pali outbreak, 1836-1838, endeavors were made to stop infection spreading by quarantine, and lines of cordon were established between infected and non-infected areas. The means adopted were ineffectual. When it is remembered how extremely difficult it is to make such a quarantine absolute anywhere, it is not to be wondered at that the system should have been unproductive of good results in a country where the inhabitants were at every device for breaking it. As to the merits of such a system, even if perfect, I will quote the opinion of Dr. Ranken, who investigated that epidemic: "The suspension of the internal trade of conterminous districts, depriving the farmer of a market for his produce, the merchant of the use of his capital, and consequently the laborer of his employment, diminishes or takes away that supply, in the continuance of which the improvident and penniless mass of the people depend to-day for subsistence to-morrow. Nothing, in short, appears to be more calculated than an efficient cordon to assist famine, disease, and with the concomitance of an impure atmosphere, the very infectious or contagious fever which it is intended to eradicate; the combined coercion, restraint and oppression subversive of the functions of society, which the system of quarantine involves, are inferior only to the horrors of plague when it actually prevails."

Again, Dr. Irvine, also engaged in the same epidemic, says: "From what I have myself observed of the plague, it appears that in a small place where only a few cases occur it is very easy to be eradicated; but let the malady once take a firm hold in a large, populous town, to arrest the progress of the scourge will be found in India an impossibility."

To come now to later times, and it will help to an appreciation of the difficulties to be met, to bear in mind the desiderata in combating the spread of any infectious disease, (*a*) early detection of cases; (*b*) discovery of the source of infection and cutting it off; (*c*) isolation of the sick, and destruction by fire or disinfection of articles which may prove sources of future infection. The series of epidemics which have prevailed over India started in Bombay in 1896; the source of the infection and the time of its appearance being unknown. So, two of the important conditions, early detection of cases and dealing with the source of infection, necessary for combating such a disease as plague, could not be fulfilled. When plague was declared in Bombay, on September 23, 1896, it was already prevalent over the city. I will endeavor to state concisely the preventive measures adopted and the results.

1. Efforts were made in the direction of general cleansing of insanitary spots, flushing gullies, lime-washing houses, and disinfecting premises where plague occurred. Result, plague continued to spread.

2. Proclamation was issued that cases of plague were to be segregated, and premises disinfected, if necessary, by force. Result, exodus from the city, riots, and more plague.

3. Eight days later another proclamation was issued, modifying the former one, and no organized attempt was made to segregate the plague cases. Result, plague continued to spread.

4. After the epidemic had passed its fastigium and was on the decline, a Plague Committee was formed, composed of a general, water-works engineer, member of Indian Civil Service, and medical officer in charge of an obstetric hospital, which proceeded to deal with the subject at the point of the bayonet. Houses were compulsorily searched, cases were removed to hospitals, and premises evacuated and disinfected. Result, plague continued to decline.

I held an appointment under this Committee and I can say that Bombay had never had such a cleansing before. The effect on the plague was not obvious; the compulsory measures were instituted when the epidemic was already on the decline, but at all events they promised well for cleansing the town of infection. The health officer of Bombay reports concerning the institution of the Committee that "it was a period of panic and irritation. The measures were followed by concealment of cases, and concealment led to the intensification of the type. The conditions ex-

isted which it would have been necessary to create had it been desired to intensify the disease."

The promises as to the measures destroying the infection were not fulfilled; far from it, The disease began to display activity again in September, 1897, after a lull from July. Search from house to house was again instituted, but as the protecting presence of troops was withdrawn, very serious riots ensued. The system of attempting to get cases reported through Vigilance Committees, composed of influential members of the native communities was then started and failed. The end of it all was that the disease went unchecked and Bombay suffered from a more severe and virulent epidemic and a larger mortality than obtained in the first outbreak. The history was repeated yet a third time, and plague continues in Bombay. I think the lesson to be learned from the experience of Bombay is, what not to do.

The next outbreak with which I was personally concerned was at Bangalore, in 1898-1899. As Bangalore was connected by rail with infected areas in the Bombay Presidency, efforts were made early to prevent the entrance of infection. Inspection of all railway passengers was instituted, with power of detaining all persons coming from infected areas, and removal of plague cases to hospital, and of persons who had been in contact with such, to a segregation camp. The disease came nearer to Bangalore and infected it; and it was reported: "If any lesson is to be learned from the results of these measures it is that plague cannot be kept out of a place by railway, still less by road inspection." The disease broke out in two different localities almost simultaneously. One occurred on August 12, 1898, in the person of a man who had arrived the previous day from Hubli, a badly infected area. On August 13th plague was found in a family near the railway sheds at the station. Supposing that the first related case was a direct importation from Hubli, which is reasonable, there is nothing to show when or how the disease was introduced which affected the second family noted. This family consisted of coolies employed at the railway sheds, but whether the infection was brought by human beings, or fomites, or other means is unknown. The disease at first spread slowly, but by the middle of September was extending rapidly, reached its height in October and November, and in March, 1899, the epidemic ceased.

I will briefly summarize the measures adopted. At first an attempt was made to deal with the disease as had been done in Bombay, *i.e.*, by force; only, forcible house-to-house searching was not carried out. But before the people had experienced any severity, they determined not to have any plague measure at all; an exodus set in; passive obstruction of every kind was practised, and on one occasion active opposition raised. Every device was adopted for concealing cases; corpses were thrown out on the roads, removed into other quarters than those in which they had died, disposed of in wells and tanks, or secretly buried. The people would respond to no inducement to declare cases, and the better class of native offered no help; chiefly, if not entirely, in the former case, from dread of removal to hospital and segregation camp. Men were then placed in charge of districts to get information of cases in any way they could, and it was penal to dispose of a corpse without a medical certificate from a medical practitioner or a Government Medical Officer. At first native hakims were allowed to grant certificates, but as only nine cases out of some hundreds certified by these men were said to be plague, and such unique causes of death as from "perjury" and "the Grace of God" were declared, the permission to certify was withdrawn. Disinfection was carried out, patients found suffering from plague sent to hospital, and those who had been in contact with them to segregation camp. The number of people segregated was out of all proportion to the plague cases, and segregation was an obvious failure. The same thing has obtained all through the history of the disease in India. The difficulty of dealing with the outbreak was increased enormously by desertion and strikes among menial establishments; attendants for the hospitals had to be imported from elsewhere, coolies could not be got for disinfection work, or removing corpses, which had to be left in the houses for considerable periods. The organization was in working order when the epidemic began to decline, and any inferences drawn then as to the effect of improved measures hastening the downward course, I think, are practically valueless. As regards any result from the earlier measures, it was not in the direction of abating the disease, but from the concealment of cases, removal of sufferers from one place to another, indiscriminate distribution of corpses, all owing to dread of segregation, actually contributed to the spread of plague.

The third place in which I have had experience personally of plague is here in Calcutta. Here, again, we are defeated at the outset, the method and time of the introduction of plague being unknown. When I took up the appointment of Medical Charge of the Plague Department, there was no doubt as to the existence of the disease in Calcutta; this was in July, 1899. The early history of the subject, however, is very uncertain. There was a great professional disagreement among the medical men as to the diagnosis of cases; some said they had found the characteristic bacilli in the blood and declaring the patients to be suffering from plague, others equally emphatically denying that the cases were plague. In October, 1896, the Health Officer at the time said he had seen cases of plague which were declared by others not to be so. The former said that the drastic measures adopted by him stamped out the commencing epidemic. It will not be profitable to continue this part of the subject. The first cases about which there was any agreement occurred in March and April, 1898, and by the end of the latter month the disease began to spread. On April

30th plague was declared in Calcutta, and the pronouncement was anticipated by the populace, and a panic set in from fear of prospective plague measures, including inoculation, resulting in an unprecedented exodus from the city, it being estimated that from one-fourth to one-third of the population left. The orders for dealing with the epidemic which were promulgated at the declaration of plague, on April 30th, were the Bombay Rules, house-to-house visitation, segregation of sick and those who had been exposed to infection, etc., but the orders were modified in that they provided for private hospitals and segregation camps for the better classes. Inoculation was recommended, but no suspicion of enforcement was to be allowed. Then followed a period of protest on the part of the populace in the shape of strikes and disturbances; during which a mob burnt an ambulance in the street, murdered an Austrian, who was an object of suspicion as an inoculator, owing to his carrying a hand-bag, and attacked an English medical man on plague duty who shot two men in self-defence. During this time the general health of the town was remarkably good, and there was a prevalent public opinion, shared by the native practitioners that there was no plague at all. This idea is still prevalent and fostered by certain sections of the press and by medical men. The total number of plague cases reported up to the end of July, 1898, was 190; so it will be noticed that the disease had not spread to anything like an alarming extent; and the area in which it was prevalent was comparatively limited and the most crowded part of the town. However, as no compulsory measures were practically put in force to detect cases, it is an uncertainty as to how many cases of plague actually occurred and, had they been enforced, we have seen that they would certainly have failed to attain such an object. The only measures adopted was disinfection of rooms where cases were found to have occurred. Calcutta was declared free on October 10, 1898; the total number of cases reported from August 1st to October 10, 1898, being 40. After October 10th cases of a more or less suspicious nature continued to be found; and in January, 1899, they increased, with no doubt as to the fact of their being plague, and on February 24, 1899, Calcutta was again declared infected.

I remarked just now that during the first outbreak compulsory measures, except as regards disinfection, were practically observed in the breach; and on February 24th, when plague was again declared, what I consider to be the first step in advance was officially taken in dealing with the epidemic in a large city. It was recognized that stringent measures were desirable, but experience in other parts had proved the desirability of modification, and improvements. The resolution issued by the Lieutenant-Governor of Bengal, Sir John Woodburn, ordered that no one should be compulsorily removed either to hospitals or segregation camps. In this way it was hoped that cooperation of the populace would be secured in bringing cases to light. This hope has not been fulfilled; and, with very rare exceptions, the only means of judging the extent of plague is by the system adopted here for the first time, of closely investigating the causes of deaths, from relations and friends. If the case be decided as one of either plague or suspicions of plague, this infection of the premises where the death occurred is carried out; articles destroyed are compensated for, and other articles are disinfected by steam. The only form of compulsion is that this disinfection must be performed; and no material difficulty has been experienced on this point. The people practically afford no help in reporting cases before or after death, even under these mild regulations; indeed, they make investigations into cases very difficult in various ways, which suggest themselves to their ingenuity; but, at all events, we have no disturbances, no strikes, no indiscriminate disposal of corpses; and, what is notable, no alarming prevalence of plague. This remarkable immunity of Calcutta, which, as regards insanitary areas, is enough to please the most fastidious of sanitarians, will be referred to again; but I will say here that I attribute it a good deal to the non-enforcement of compulsory measures, except disinfection. There are rare instances in which a second case has occurred in a room after disinfection, and as evacuation of premises is not enforced, the inhabitants reoccupy rooms perhaps as soon as they are dry, if not before.

History as regards plague in Calcutta, has not been consistently repeating itself. The exact extent to which the disease prevailed in 1898 is unknown, and no good will be gained by quoting figures. The fact which stands out clearly is that although plague obtained a footing, for some reason or reasons, the epidemic has kept within very moderate limits as regards incidence of cases, and this in spite of the fact that the infection has existed over the whole area of Calcutta. I have given one reason to which I attribute this, rightly or wrongly, and now mention other points having a possible bearing on the unique course of the disease in India, here. The population is approximately that of Bombay. The density of population in Bombay in the most crowded areas is from 503 to 670 persons per acre; in Calcutta, from 107 to 276. Cases have been more persistent in the areas here, showing the greatest density of population, 161 and 226 people to the acre. Bombay City is chiefly composed of streets upon streets of many storied buildings, with as many as 1000 to 3000 people under one roof. Calcutta, although in the large bazaar, consisting of high buildings, is also largely composed of bustees, collections of mud and wattle huts, with no second story. Plague has persisted in such bustees where the population has been thick, but I consider that the safety of Calcutta has been contributed to by this construction of the city, each inhabitant having a comparatively large breathing area. The idea has been suggested that the local conditions are not suited for the development of the poison. I suggest that some of the

consideration so lavishly expended on bacteriological suppositions should be devoted to the social and sanitary improvements of the population. We know nothing and can observe nothing as to the likes and dislikes of the bacillus, except through the medium of the human being. There is enough dirt in Calcutta to satisfy any ordinary requirements of any bacillus, but the virulence of its nature is combated by some condition or conditions applying to the human population; and if less attention were paid to the bacillus and its necessary conditions for vitality, and more attention to the human being and his conditions making for immunity or otherwise, we should make more advance. In short, hitherto we have had hold of the end of the stick in the mud with the bacillus thereon; the *man* holding the other end has received scant attention. The condition affecting the man, which I consider to have contributed to the marked immunity of Calcutta is a small population per acre. Whether there are other conditions affecting personal habits, food, or any other circumstances concerning personal hygiene, is a question waiting solution.

I may conveniently here introduce examples of the possibility of stopping an outbreak in a limited population. They occurred in the Bangalore epidemic. A village, inhabited by dhobies (washermen) became infected, and was a source of danger to the Royal Artillery lines close by. A camp was built on an open plain and the people to the number of 543 removed to it. Cases had been occurring daily, and three cases occurred the day after the evacuation. The village was thoroughly disinfected, and the people went back fourteen days later. No more cases occurred. Another village, in a low-lying and unhealthy situation, became infected; and cases persistently occurred. A camp was built on some high ground near, and the people, 1700, removed. Three cases occurred within the five days following evacuation, and there were no more. Such instances show that the opinion as to the plague poison having a great predilection for localities to have good foundation, and are further exemplifications of its comparatively low contagious powers, once overcrowding is stopped, and the people get fresh air and light.

It is a matter of observation that some people have a natural immunity from infectious diseases, but, depending as it must on individual idiosyncrasies in a great measure and to a degree which we do not understand, the property does not help us in the face of a rising mortality in a large city. It is also a matter of observation that there is an acquired immunity in the case of vaccination and smallpox. This became known to us through an observed fact of nature, and not as the outcome of any theory. The principle on which nature works in that process is still a mystery; but we have the fact remaining. Efforts have been made to impart an individual immunity against plague by M. Haffkine, and although I personally think the subject very much *sub judice*, I will give the strongest evidence in its favor of which I am aware. I must first say that any figures dealing with preventive inoculations on Europeans are valueless in my mind; because Europeans in this country have been naturally immune. The few who have been attacked were particularly liable; only what might have been expected from the state of their health.

Preventive Inoculation.—M. Haffkine's fluid consists of plague virus cultivated in broth, the bacilli killed by heat, the broth and the dead bacilli being injected. The preventive results were carefully observed, under favorable circumstances for investigation, at an outbreak in Damaon near Bombay in 1897. The period of observation extended from March 26th to the end of May; 2197 persons were inoculated, and it was estimated that 6033 remained uninoculated. Among the latter there were 1482 deaths, a mortality of 24 per cent.; in the former there were 36 deaths, a mortality of 16 per cent.

In cases where inoculation has been practised, it has been done mostly when the epidemic was declining, and to take one instance, that of Poona, it is reported that no cases occurred in the hospitals among those inoculated; but that the inoculation took place during the decline of the epidemic, and in persons who were not living in highly infected localities, nor belonging to the classes that had chiefly suffered from plague. There is no definite idea as to the length of time immunity is conferred, and to induce a large population to try the experiment in this country is impossible. Any idea or suggestion of inoculation is enough to create panic or riots. Personally, I think the subject in too tentative a stage at present to justify authorities even strongly recommending it; and would in preference advocate an extension of the means we know to confer an immunity, *viz.*, light, air, food, and plenty of them.

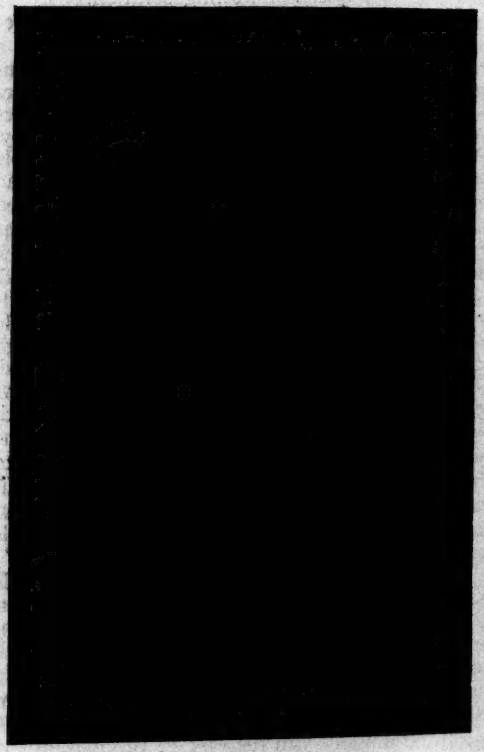
In conclusion I will briefly review the lessons to be learned from Indian experience of plague and the difficulties to be contended with. The lesson which stands out in large letters is that the compulsory measures attempted have failed to have the desired repressive effect on the disease, because the populace have, to a man, been dead against them and the authorities. Governments of various provinces, instead of having the people with them, have had to combat opposition of all sorts, as well as devise means of fighting the disease; and the plague plus the inhabitants have won the day all along the line. Any measures to be really effective must carry the people with the Government. I may say at once that such measures have yet to be devised. The utmost consideration which is shown to the people here in Calcutta has failed to enlist them on the side of the Government in the direction of detecting cases of plague, or inducing them to report sickness of any kind. I think this may partly be accounted for by distrust as to what stringencies may be imposed on them, should the epidemic attain more formidable proportions. On the other hand, there is the initial dislike to being inter-

fered with in any way; and it must be remembered that Occidentals, as well as Orientals, dislike their sick being removed to hospitals and their homes disturbed. The main line of objection to plague measures has always been a dread of segregation, with separation of members of families; and Government orders that no wife would be separated from her husband, or a mother from her children, have not succeeded in inspiring confidence. The people display an absolute apathy and indifference to plague, as a rule, but let the Government suggest means by which they may be spared the affliction and a panic ensues. Cases of illness are concealed with every ingenuity, and each one vies with his neighbor in giving false information. Violation of caste is made an excuse for objection to any preventive measures, such excuse having no foundation. Facilities have been given for the institution of private and caste hospitals, but no advantage has been taken of them. Ignorance, distrust and prejudice have held their sway, supported by superstition. Stories have been current that the British Raj is on the wane and that the Queen wants so many hundreds of heads to appease the adverse Fates. The better class of the native communities have been unresponsive to calls for assistance in allaying fears and too often have been the cause of fostering agitation both of an overt and covert kind. It is said in one Government report, "exuberant offers of moral and material assistance were received, but with the increase of the disease further cooperation was withheld, and it is a noticeable feature of the outbreak that Government officers were at no time afforded real and effective unremunerated assistance by any of the inhabitants. The tendency was rather to take advantage of the difficulties that arose for the purpose of private advantages and enrichment." Stories are set about that people are killed in the hospitals. The medical practitioners afford little or no help in reporting cases for fear of losing practice, and, moreover, falsely certify as to the cause of death, perhaps, we will charitably suppose, from ignorance. There is no registration of deaths in India, a fractional part of the population only being sure of any sort of medical man; consequently any cause of death which suits the fancy of a relative is entered at the burying ghat or burial ground. These difficulties need not be multiplied. The whole question is a medico-political one, in which medicine has to be subservient to policy. Medicine says, detect and deal promptly and decisively with the first cases; policy yet awaits a solution as to how to do that. Until that be solved I have no doubt that the policy obtaining in Calcutta at present is the best yet promulgated; get the population against Government as little as possible, provide a hospital for sick if they want to utilize it, if not, leave them alone, carry out disinfecting measures with a minimum of irritation, employing European medical men to supervise everything. One last word, as a guide for the future. Devote some of the labor and attention bestowed on the microbe with such unproductive results to the human being, who is the chief object concerned. Erection of light, airy habitations to replace filthy hovels, and total abolition of dirty, overcrowded areas will do more to stamp out plague than all the bayonets of the British Army. This takes time; time, moreover, counted not by months or years, but by generations. If the money spent on plague operations in India since 1896 had been expended even to half the amount, on improvements in Bombay City before the disease appeared, what a different tale there might have been to relate.

CLINICAL MEMORANDUM.

THE XIPHOPAGES, ROSALINA AND MARIA.

THROUGH the courtesy of the editor of the *Scientific American* we present the following account from its columns of the recent effort that has been made at the Hospital Misericordia of Rio de Janeiro, by surgical procedure to separate these remarkable twins. The operation was undertaken by Dr. Alvaro Ramos, an abstract of whose report was furnished the *Scientific American* with the accompanying photograph and radiograph.



The Xiphopages, Rosalina and Maria.

"After the completion of the physiological experiments which proved the functional independ-

ence of the system of Rosalina and Maria, I still had considerable doubts as to the nature of the tissues constituting the union of the two trunks, and as to the organs that might be found there.

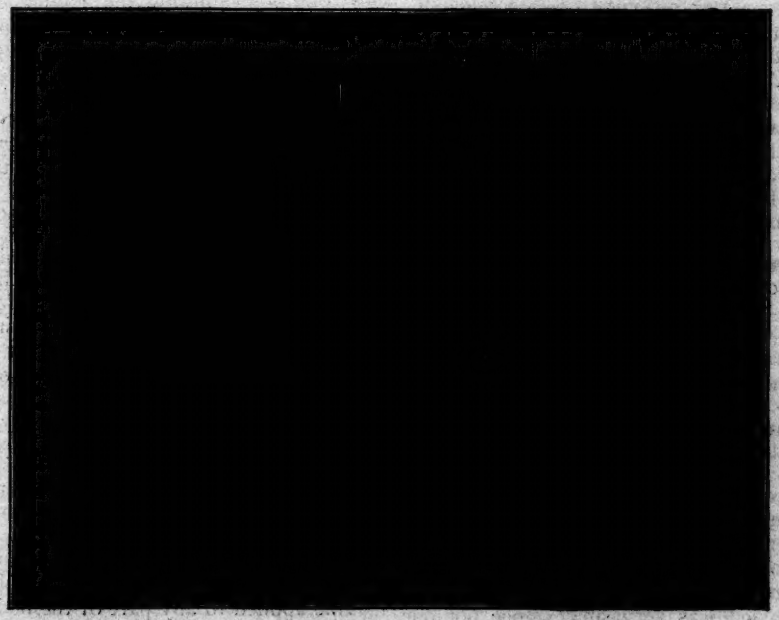
At the last radiographic exposures, which formed the experiments of Roux and Balthasar, strong doses of hyponitrate of bismuth were administered to the two girls, and owing to its opacity to Roentgen rays, this substance was revealed in the stomachs and in some of the intestine coils, thus proving that there is no connection of these organs in one abdominal cavity with those in the other.

Although I was much encouraged by this result, I still had no certainty as to the (possible) union of the livers, a point which could not be cleared up by the radiographs and to which my attention had always been directed, not only on account of the published results of five autopsies in similar cases, including that of the celebrated Siamese twins, but further for terato-genetic reasons.

After making up my mind to try an operation, I diligently took all possible precautions, in order that, if the desired result could be attained, the unsuccessful operation should at least have no disastrous effect. I proposed to begin with laying open the abdominal cavities; then to ascertain if all their organs were completely separate; and, finally, if the possibility of a complete separation was demonstrated, we should cut the cartilaginous ligaments which are at the base of the ensiform appendices and of the false rib; by preserving these ligaments until the end, we should insure the healing of the operative wound notwithstanding strains, in the event the operation could not be completed, as unfortunately turned out to be the case.

After fitting up two operating tables and the necessary appurtenances, and distributing the implements, Drs. F. Fajardo and Miguel Pereira were intrusted with chloroforming Maria, and Drs. Miguel Couto and Antonio Leao with chloroforming Rosalina. Fifteen to twenty minutes later the two sisters were perfectly anesthetized and laid on the first table—Rosalina on the right and Maria on the left; the side on which the thoraces were sunk in most was on top.

I began the operation by an incision of about six centimeters in the skin of the abdomen of Rosalina, a curved incision with the concavity facing toward Maria, distant, at the half height of the connection of the two bodies, about three centimeters from the median line.



Radiograph of the Xiphopages Rosalina and Maria.

The skin having been folded over toward Maria, I found on the median line of the connection the separation of the two recto-abdominal muscles, the right one of Maria and the left one of Rosalina. After moving these aside, as well as the aponeuroses, I first met the fat pre-peritoneal tissue, and then cut through the peritoneum common to both cavities. This opening I enlarged by continuing the initial incision downward four to six centimeters, to the lower end of the connection, leaving the umbilicus on Maria's side. It then became easy to recognize the separation of the intestines and of the stomachs, and to thus confirm the result of the radiographic experiments of Roux and Balthasar.

Turning then my attention to the upper part of the incision, I discovered at once that her heart was not directed toward the right, confirming my previous opinion, founded upon the difficulty of auscultation on the left-hand side, and upon the entire absence of the kick of the apex.

Immediately below the diaphragms were the livers, united by the left lobes, which appeared to form a single body common to both livers, each of which had its particular gall bladder. At the height of the central line there was a suspending ligament, which, from its attachment to the connecting cartilage of the two ensiform appendices, extended to the common chamber of the two livers. In the hope that this ligament might be continued through the parenchyma of the livers, thus forming a septum separating the two lobes, I made an incision in this part of the common chamber, and, instead of finding a septum, I ascertained the continuity of the parenchyma.

I cannot indicate definitely the relative positions of all the other viscera, since the positions had partly been changed. I confined myself to ascertaining the extent of the surface connecting the two livers, and putting my right hand around them, with the fingers in contact with the lower or concave face, and the thumb over the convex top surface, I estimated that the surface to be cut would be about ten centimeters in length and three or four centimeters in width, corresponding to the thickness of the lobes at this point.

Such an operation with all the preparations for insuring hemostasia and the safe replacing of the livers in the abdominal cavity, in accordance with the latest methods of resection of the liver, would certainly require a considerable amount of time. This, added to the time already spent on the investigation, was more than these tender organisms could be expected to resist successfully, and every minute still further reduced their vital energy. I concluded to procede no further. The wounds were dressed in the usual way, and after being awakened without difficulty, the two little girls were soon pretty lively and did not exhibit any great prostration, it being remembered that the loss of blood was very small, since not one hemostatic ligature was required.

Thus the double investigatory laparotomy was fully crowned with success. While I did not achieve what I had hoped I might possibly be able to accomplish, I have at least the satisfaction of having, without injury to the patients, ascertained the conditions of the problem, the best solution of which we have to seek. With surgical methods now known, the separating operation would have a fatal result unless there should be found a method of reducing the parenchyma connecting the two livers, or unless, at least, such a reducing or regressive process should be brought about by some mechanical means.

Pharmacists Protest.—The Manhattan Pharmaceutical Association protests against the bill before the Legislature requiring poisonous mixtures to be placed in bottles of special design.

MEDICAL PROGRESS.

Therapeutic Application of Moist Heat.—Although dry heat can be borne in very much higher degree than moist heat, yet it is almost universally recognized that moist heat accomplishes far more therapeutically with lower temperatures than does dry heat with higher ones. Hugo Davidsohn (*Berlin klin. Woch.*, Jan. 29, 1900) says that the various applications in vogue for obtaining therapeutic effect with moist heat are the local steam or vapor baths, the Priesnitz and the cataplasmic methods. These last two methods are distinguished from each other in their effect, according to Quincke and Solomon, in that the Priesnitz applications affect only the superficial tissues, while a hot cataplasm of happy consistency stimulates the deeper tissues. There are two conditions limiting the application of these cataplasms, first, the degree of heat which various patients can bear and, second, the material out of which the cataplasm is made. As far as the first point is concerned the author says that he has known patients to bear comfortably a temperature of 117.5° F., while others are very sensitive to a temperature of 104° F. As for the material out of which the cataplasm is made, it is necessary that it have the requisites of being very plastic and that it is a poor conductor of heat. The substance best fitted for this is the mineral earth known as Fango. In addition to these advantages this substance is odorless, it does not decompose and, therefore, saves the skin from disagreeable maceration. In order that the patient may be treated with a higher degree of heat than he at first can bear, it is advantageous to subject him for an hour or two to constantly increasing temperatures when a surprising degree of tolerance is attained. This regulation of the degree of heat can be managed by an arrangement of the author's, which he calls a coil-mattress and coil-pillow. As the name implies, it is simple a series of coils or rubber tubing, simulating Leiter's coils, attached to a mattress or pillow which may be applied to any part of the body. This is supplied with water at the requisite temperature by a simple, portable arrangement.

Addison's Disease.—H. J. Campbell (*Quarterly Med. Jour.*, Feb., 1900) after noting the fact that about Halifax he had observed a number of cases of Addison's disease, discusses some of the more important features of this affection, more especially recent experimental work done with the suprarenal glands. The prominent symptoms of the disease, asthenia, muscular weakness, low blood-pressure, feeble cardiac action, headache, vertigo and the gastro-intestinal symptoms may all be explained, in large part at least, by the lack of the normal internal secretion of the suprarenal gland. Experiments of Langlois, who found that the disastrous results following removal of the adrenals might be averted if but one-eleventh of the gland is allowed to remain, also point in the same direction. The explanation of the pigmen-

tation is a more difficult matter. The author believes that it is a reaction, protective or conservative in its nature. From the therapeutic side, cod-liver oil, arsenic, and protection from cold, offer the best general means for treatment. From a theoretical point of view the use of suprarenal extract should give good results, but up to the present time its efficacy has not been definitely proven. This lack of action is probably related either to some defect in the mode of preparation, or more probably to the method of administration. Administration by means of the mouth has given very irregular results and the experience acquired by ophthalmic practice has demonstrated how readily the extract may be altered and rendered worthless. The ideal mode of administration would be by intravenous injection in very small doses, but this is impracticable for continued usage. The mode of administration recommended is by the rectum, in the form of suppositories made up with a neutral fat. The amount required is very small, and it would probably suffice to administer a suppository night and morning over a long period, with occasional intermissions. The frequency and the dose would vary with the individual and should be determined by experience.

Lateral Ureterorectal Anastomosis.—Dr. Reuben Peterson made the following communication to the Chicago Academy of Medicine: "At a former meeting of the Academy, during the discussion of Dr. Lydston's paper, I referred to some recent experiments I had been making in uniting the ureters with the rectum. The ureters were passed under the muscle for a short distance and then made to penetrate the mucosa, various methods of suturing being employed to secure union between ureter and bowel wall. Infection of the kidneys, as shown by bacteriologic and microscopic examinations, occurred in all the animals that recovered from the primary operation. It was found that the infection in nearly every instance was proportionate to the amount of stricture of the ureters entailed by the operation. Thinking that ureteral stricture and subsequent hydronephrosis, by slowing of the stream of urine, might offer increased facilities for the passing upward of the colon bacilli, I set to work to devise an operation whereby ureteral stricture could be avoided. To those who have endeavored to unite the ureter with the rectum by passing the former through the wall of the latter, it is evident that owing to the compressibility of the ureteral wall and the excessive muscularity of the rectal wall, it is only a chance if stricture does not take place, either at the time of, or subsequent to, the operation. Hence, the two organs must be united by a lateral anastomosis if stricture is to be absolutely avoided, because here the opening can be made as large as required.

"With the assistance of Dr. Connell I finally succeeded in making a lateral anastomosis between ureter and rectum, employing a modification of the right-angled suture. The first few animals died because I failed to cover the line of sutures with peritoneum. This is necessary because the ureter cannot be safely punctured by the needle as can the gut wall, and must be protected by peritoneum for fear of subsequent leakage of urine into the peritoneal cavity. For this reason I do not believe the operation devised will ever be practicable for the human being, the danger of leakage even when the sutures are well protected being too great. The experiments were made for the purpose of determining if freedom from stricture had any influence in preventing an ascending infection of the kidney.

"The specimen which I present for your inspection effectually answers this question in the negative. The dog from which this kidney was removed was operated upon November 18, 1899. The left ureter was united to the rectum in the manner described. The peritoneum and loose connective tissue about the ureter were stitched along the line of suture. Nine days after the operation he was found dead. The left kidney was enlarged to double the size of the right. The pelvis of the kidney was dilated and contained pus, the bacteriologic examination of which showed the presence of colon bacilli. The ureter was not dilated, and the opening into the bowel was patent and allowed water injected into the pelvis of the kidney to pass freely into the rectum. The ureterorectal anastomosis was perfect and there was no leakage of urine into the peritoneal cavity. The specimen shows the changes typical of pyelonephritis.

"The infection in this case took place even more quickly than in the experiments where the ureters were buried in the muscles of the bowel and where a certain amount of ureteral stricture existed. So far as this case is concerned, a free flow of urine did not prevent an ascending infection.

"In addition to my experimental work on living animals, I am carefully studying microscopically the course of the ureters, through the dog's bladder wall to see if the direction of the ureters, the muscles with which they are surrounded, or the formation of the ureteral orifice can explain comparative freedom from infection when the ureters are implanted together with the trigonum into the rectum. The results of these studies will be given later when my experimental work is reported in detail.

"We know that Maydl has transplanted the trigonum together with the ureteral orifices into the rectum in a number of cases with success and his patients have lived a number of years and are apparently well. None of these cases have been examined post-morten, and it is not certain that infection of the kidneys has not taken place. The only experimental work upon dogs in which this operation was done that I have been able to find in the literature resulted in the immediate death of the animal, hence an opportunity of studying the condition of the kidneys was not afforded.

"This specimen which I show you now is from a dog where the ureteral orifice and a portion of

the trigonum have been implanted in the rectum on one side and the other ureter cut away from the bladder and anastomosed with the rectum according to the old method I have spoken of. The differences in the two kidneys are apparent to the naked eye. The kidney where the ureteral orifice was implanted is normal in appearance, while the other shows the characteristic changes of pyelonephritis. Bacteriologic examination was negative in the first kidney, and showed large quantities of colon bacilli in the other kidney. The dog lived ten days and died from peritonitis due to a mural abscess.

"The reason for the large primary mortality in animals subjected to Maydl's operation is because of its complexity. I have read a description of the operation a number of times, and I find it far from clear. I have devised an operation for the anastomosis of the trigonum together with its ureteral orifices with the rectum, which is simplicity itself, and any surgeon who can successfully perform an intestinal anastomosis can perform the operation with ease. The majority of the dogs upon which I have operated by this method are living and at some future time will be killed and the condition of their kidneys carefully studied."

Hernias of Cecum and Sigmoid.—The radical cure of hernia consisting of cecum or sigmoid slipped down behind the ordinary hernial sac, has long been tried with but little success. Many surgeons close the wound without attempting reduction or cure. These hernias even when successfully operated on are unusually prone to recur. R. F. Weir (*Med. Record*, Feb. 24, 1900) discusses this subject and suggests an operative procedure giving hope of a permanent cure. As a matter of fact, these hernias are usually of the ascending and descending colon rather than of sigmoid and cecum. These portions of bowel usually uncovered by peritoneum posteriorly, slip down behind the hernial sac and form attachments to the deeper tissues, thus becoming irreducible early in their history. They cannot be positively diagnosticated before operation, but there are a few signs that help. They are most common on the left side in males at or beyond middle life. They usually give a history of early reducibility, but of not being controlled by a truss. Soon they become irreducible, and are then usually scrotal. Because of the frequency of this type, every large irreducible hernia should be approached by the knife with great caution and with full knowledge of the peculiar anatomical relations involved in order to avoid wounding the gut. Often one is at first confused by the presence of enlarged epiploic fringes. Having recognized the postperitoneal gut, what shall be done with it? It is hard or impossible to reduce by mere manipulation. The separation of the gut from its posterior attachments and its return to the abdomen is apt to lead to serious interference with nutrition, and to be followed by gangrene, fecal fistula or perhaps death. To excise the herniated gut and do an anastomosis within the internal ring is too risky. To simply close the wound with the hernia *in situ* is unsatisfactory to both surgeon and patient. Weir suggests the following way out of the difficulty, and has successfully operated on two cases. The posterior wall of the sac, which already is adherent to the front of the herniated gut, is dissected up, beginning at some distance from the gut on all sides. As the gut is reached, it is separated from its posterior connective tissue bed, up to beyond the internal ring. The peritoneal flaps derived from the posterior sac wall are adherent to the gut in front and are turned back and sutured over the posterior raw surfaces. In this manner the gut is completely surrounded by peritoneum and is then easily returned to the abdomen. The remainder of the sac is then dissected up, the edges due to forming the above flaps are sutured together, and then one practically has a sac like the ordinary one and proceeds as in other herniæ with the operation of his choice. Removal of cord and testes helps to obtain a permanent cure. The two cases operated on by this method have thus far passed eight months without sign of recurrence.

Finer Structure of Bacteria.—K. Nakanishi (*Münch. med. Woch.*, Feb. 6, 1900) has obtained some astonishing results with a new staining process which is applied as follows: A saturated solution of methylene blue is dropped on a slide and carefully spread, the excess then wiped away until the glass appears of sky-blue color. The remaining solution is then allowed to dry. The substance to be examined, suspended in some fluid medium in which the stain is freely soluble, has in the meanwhile been placed on a cover-slip, which now is inverted on the slide and at once examined. The results obtained were: (1) Nuclei of polynuclear leucocytes stained only after the cells were dead or had lost their ameboid movements. Large and small mononuclear cells took up the dye poorly. (2) Erythrocytes stained only when abnormal. (3) Malarial parasites showed all details of their internal structure with remarkable clearness, but the chromatin granules in the crescentic bodies were not seen. (4) All bacteria, including even the tubercle and leprosy bacilli, were well colored after life had been destroyed with formaline vapor. When young and grown under favorable circumstances they all appeared as short, mononuclear cells. The protoplasm had more marked affinities for the dye the older the organism, but always appeared homogeneous. The nucleus, which usually was round or oval and small, had a centric position and took on a more purplish color, and would leave the cell in presence of protoplasmic poisons. Great variations were found in the membrane; in some cases it was well developed, in others rudimentary or absent, especially in the young bodies. The mucoid capsule stained well where it was present, not, however, the flagella. Karyokinetic cell-division

could be demonstrated; in some cases the cell did not divide with the nucleus, in others the new organisms remained united by a partition. When the nucleus enlarged and lost its property to stain, it became a spore.

Mulberry as a Diuretic.—The use of the leaves of the mulberry-tree as a diuretic is popular in Siberia. This formula is recommended: Leaves of the mulberry tree, 40 grains to 2 cups of boiling water. Let this steep eight to ten hours in a warm place and take a cupful in the morning and another at night. Continue this for three days. The taste is not disagreeable. The secretion of urine gradually increases: from 54 ounces at the beginning it rises to 62, 72, and finally 88 ounces. The subject of this observation was a man eighty-four years old, who had suffered for ten years with edema of the feet.—(*Bull. gen. de Therapeutique*, Feb. 8, 1900.)

Eulactol.—J. W. Frieser (*Klin. therap. Woch.*, Feb. 11, 1900) insists on the great importance of proper diet in all weakened and convalescent states. The value of concentration is obvious, and this property is best found in the various foods which flood the market. But high nutritive value, easy digestion, agreeable taste, and free solubility are no less important. Eulactol, a preparation made from eggs and milk and containing proteid, fat and carbohydrate, in proper proportions, seems to rank among the best and can be given up to about two ounces daily, in coffee, etc. It is especially indicated in functional or chronic gastric or enteric disease, tuberculosis, scrofula, rachitis, anemia, chlorosis, fevers and senile marasmus.

Observations on Brain Surgery.—After operating on forty-eight brain cases and performing many experiments on animal brains, G. W. Crile publishes (*Med. Record*, Feb. 17, 1900) the following observations. The immediate effect of increased intracranial pressure is not marked until the brain is compressed five to seven per cent. of its volume. Respiration is sooner and more profoundly affected than the blood pressure. Respiration is first slowed, then arrested. The higher the blood pressure, the higher is the intracranial pressure necessary to cause respiratory arrest, and when such arrest has occurred, if the blood pressure be increased respiration may be resumed. Increased intracranial pressure causes slowing of the heart, followed by intermissions and later complete arrest. When pressure persists, the inhibitory mechanism fails, and very rapid heart-action follows. With the brain under pressure, less anesthetic is required to cause surgical anesthesia, and the deeper the anesthesia the earlier and more abruptly respiration fails; both alternating rapid and slow pulse indicate an exhausted cardiac center, a fatal prognosis, and a very strong contraindication to operative procedure. At the same time the vasomotor system is exhausted. During operation an assistant should always be ready to do artificial respiration, and ice and hot water should be at hand for alternate application to chest and abdomen as respiratory stimulants. If respiration ceases and cannot be renewed, the skull should be opened as quickly as possible and the pressure relieved, when normal breathing will almost surely recur. The first effect of blows on the skull, gunshot wounds, rapidly increased intraventricular pressure, etc., is respiratory failure, while the heart continues beating for some minutes. Therefore, artificial respiration is an important first-aid in brain injuries, and since increase of blood pressure favors the return of spontaneous breathing, proper stimulation should be given. There is a well defined area, external to the olfactory tract and in front of the uncinate gyrus, stimulation of which causes arrest of breathing. This area rests directly against the base of the skull and is therefore liable to injury by either direct or indirect violence. In one case, dying of respiratory failure, after a fall, autopsy revealed a marked laceration of just this portion of the brain.

Basophile Granules in Erythrocytes.—While the observation that basophile granules occur in the red blood-cells in many cases of severe anemia is not new, M. Cohn (*Münch. med. Woch.*, Feb. 6, 1900) draws attention to the discordant views as to their significance. To determine whether they result from the degeneration of the nuclei or the cell-protoplasm itself, an artificial anemia was established in several rabbits by drawing off as much as one-third of their blood. The granules were not found at once after venesection, but appeared one or two days later chiefly in polychromatophilic cells, and many of these without granules were also apparent. The late appearance of these changes speak for cell degeneration, rather than breaking down of the nucleus. It is known that large losses of blood are followed after several days by a hydremic condition of the circulating fluid. This is also seen in all forms of anemia except chlorosis, and it is probably that it stands in definite relation with and is the chief causative factor in the cell changes.

Chloroform Narcosis.—A few weeks ago there appeared an article on this topic by Koblanck, in which he describes various symptoms pointing to early asphyxia in narcosis, and in the course of which he cites Czempin as not having properly recognized the significance of these danger signs. Czempin (*Centralbl. f. Gynäkol.*, Feb. 3, 1900) appears and says that Koblanck misquotes him. In his reply, Czempin states that the much advised method of drawing up the epiglottis directly with the finger at the outset of asphyxia, as also recommended by Koblanck, ought not to appear in any text-book on the subject as a means often to be employed. He has himself never practised this method. As a defense of his idea Czempin says that as chloroformed patients breathe exactly as do healthy persons when awake and breathing through their nose, so is it necessary in individuals with obstructed nasal passage

to have a free entrance for air through the mouth. This is attained easily and best by drawing the tongue forward with a silk ligature through the end of the organ. If in deep narcosis, the tongue has fallen back, obstructing the entrance of the larynx, asphyxia results. At this stage it is necessary to free the laryngeal passage. The way to do this is to open the mouth, forcibly if necessary and to draw forward the tongue with the proper forceps. The pushing forward of the jaw will often also accomplish the same thing, indeed, if a tendency exists for the tongue to fall back, it is wise to keep the jaw protruded during the entire anesthesia—otherwise this procedure is not necessary. Another point to which Czempin wishes to call attention is that so often seen in debilitated patients. After a few whiffs of chloroform have been taken they suddenly stop breathing. If shouted at to breathe, they will recommence, but off and on during the giving of the anesthetic they will breathe irregularly or stop at times altogether. Instead of pushing the chloroform, as is so often done at this point, it is wise to desist for a time, for with this poor quality of respiration the heart perceptibly weakens. The author says finally that in old and weak patients he recommends Billroth's formula for the anesthetic: Alcohol 1, ether 2, chloroform 3 parts, to bring down the point of saturation of the drug artificially.

Guaiacum Reaction. — K. Brandenburg (*Münch. med. Woch.*, Feb. 6, 1900) has analyzed pus with the object of determining the nature of the body causing the blue discoloration when in contact with tincture of guaiac. The matter from a cold abscess was treated with chloroform-water. The sediment was filtered off and the remaining turbid fluid treated with acetic acid, the result being a heavy precipitate. It was found that this substance on purifying by repeated solution and precipitation, possessed the reaction to a marked degree. On ultimate analysis the presence of phosphorus and iron could be determined and the body was thus classified among the nucleo-proteids. Animal tissues in general have the property of adding oxygen to easily oxidizable chemicals, but vary considerably in the intensity with which they do this. Nucleo-proteids could also be extracted by simply digesting the various tissues with water; while the resulting compounds actively decomposed hydrogen dioxid they did not give the guaiacum reaction with the sole exception of the preparation obtained from bone-marrow. It thus seems that leucocytes differ chemically from the other cellular elements, but what is more important is the absence of discoloration noted in tissue rich in lymphocytes, *e. g.*, thymus. A positive reaction could also be obtained in many cases with saliva, probably due to the salivary corpuscles, and with purulent sputum and leukemic blood in considerable dilution. It is probable that the nucleo-proteid which has recently been isolated from urine in fevers, jaundice, and other morbid conditions, is not due to leucocytes, but is derived from the fixed tissue-cells since the reaction failed in all cases.

Malaria.—In an exhaustive lecture on this subject before the Italian Association, A. Celli goes deeply into the epidemiology of malaria, discussing the source of infection, the transportation of the germ, the invasion of the disease, the disposition, receptive or otherwise, of the patient, and the prophylaxis to be observed. The address (*Berl. klin. Woch.*, Feb. 5 and 12, 1900) is in substance as follows: (1) Source of infection; man is the medium and the mosquito is the real host of the malarial parasite, for it terminates its asexual life while with man and develops its full sexual existence while in the mosquito. This explains the possibility of the constant development of the plasmodium outside the body of man. The presence of both man and insect is necessary, however, to complete the so-called "infection-cycle;" for the germ, completing one period of its existence in one host, transfers itself to the other in order to develop its further growth, whence it again seeks its original home. No mosquito can infect another; such infection necessarily procedes from man. Therefore malaria is a typical infectious disease. The chief species carrying the germ is the *Anopheles claviger*, which may easily be recognized by the four black spots on its wings! Water and earth can only be considered as secondary or accessory in the infectious process in that they contain the larvæ and eggs of the insects. (2) The transportation of the disease; the name of the disease *mal aria* contains in itself the notion of bad air as the causative factor and it is believed that the disease germs are in the atmosphere in the greatest numbers about dusk and during the night. The germs arise from narrow bordered heaths and become diffused within limited areas. Winds do not scatter them about; but, on the contrary, lessen their number in the atmosphere. Forests serve as centers of origin of the miasma. These facts strengthen the modern theory of the transmission of the disease by the mosquito, inasmuch as this insect lies hidden at daytime, coming out about twilight to pursue its nefarious work; it never flies far from its birthplace and does not fly high in the air; and in a fairly strong breeze does not come out at all. The mosquito furthermore has his domicile in the damp woods and in trees.

The data concerning the epidemics of malaria serve to prove that neither water nor vegetable foods, nor still the inhaled dust, all of which have been given as causes, are to be regarded as causative factors. (3) The invasion of the germ takes place through the skin, it becoming inoculated through the sting of the insect and the sporozoa thus transferred. (4) Not a single epidemic can be fully understood if consideration is not taken of the enormous importance of disposition to, or immunity from, infection. Such disposition or immunity may be divided into organic, local, and social. (*a*) Organic; a chilling of the body dis-

poses to the infection; children especially are prone to catch the disease, the greatest mortality from it being in the ages from five to twenty years. No race is immune. In some malarial localities, however, there are individuals who in spite of all excesses and indiscretions never seem to be attacked; they seem to possess some hereditary immunity. Artificial immunity may be gained by the use of certain drugs, notably quinine and methylene blue. (*b*) Local; there exists no kind of ground which might be designated as unfavorable for the development of the plasmodium. As far as water is concerned, it is necessary in that it supports the life of the larvæ. The great source in this respect is the fresh water ponds, while saline waters—rivers, lakes, bays, etc., opening into the sea, are notably free. (*c*) Social; it need only be tersely stated that social conditions, *i.e.*, food, domicile, clothing, occupation, are great factors in disposing the individual to attack in epidemics or on the other hand in immunizing him from its ravages. (5) Prophylaxis; as is always the case, the diagnosis must first be firmly established by microscopy before a rational prophylaxis can be undertaken. The patients must be isolated, as the disease is certainly an infectious one through the medium of the mosquito. This isolation may take place in any locality where no mosquitoes abound. Disinfection of the blood by means of quinine must be early practised. The only practical method of disinfecting the insects and their larvæ is to destroy both. One of the best preparations to use for this is crude petroleum. It is poured on the marshes and bogs so that the whole sheet of water is covered with a film. Other substances used are the pollen of unopened chrysanthemums and several of the anilin colors. To protect the skin of the body against the insects' attack a soap of turpentine is very efficacious. It is largely used in Italy by officials having to perform night-duty. Sanitary precautions in malarial districts, the regulation of sewerage, the prevention of stagnant water, all serve to keep out the disease. As far as the immunization of an individual visiting an infected district is concerned, all that can be said is to pay close regard to all the points above enumerated and add "*unum facere et alterum non omittere.*"

Carbonic Acid Applications.—The results of the Nauheim treatment on diseases of the heart and circulatory systems have stimulated investigations into methods of obtaining artificial carbonated thermal baths. R. Hatschek describes such a method in the *Wien. klin. Rundschau* (January 28, 1900). He quickly applies a paste of bicarbonate of soda to the body of the patient and follows this with wrapping him in a cloth saturated with weak hydrochloric or acetic acid. By occasionally wetting this cloth with the acidified water, a very lively effervescence is produced and the production of carbonic acid is well developed. It is also worthy of notice that the production of the gas goes on even within the skin, for the paste finds its way through the pores and meeting the acid secretions of the sweat and sebaceous glands is converted into carbonic acid gas. The gas evinces its efficacy directly upon its production by its action on the capillaries and nerve-endings in the skin. Beyond this, its too great activity is somewhat hindered by the cloth wrapped about the patient. The action of the gas is shown by the originally constricted blood vessels and cold, cyanotic extremities returning to their normal state and assuming a ruddy healthy glow. The rubbing and other forms of friction take much longer to accomplish this same result than does the gas when formed in this way. For one application for an adult, about two ounces of sodium bicarbonate were found necessary, producing at the ordinary temperature of the room nearly 16,000 cubic cm. of carbon dioxid. In preparing the paste several teaspoonfuls of warm water should be mixed with it in order not to chill the body before the cloth is applied. The application must be made hurriedly and the parts of the body may remain covered alternately, while the others are being treated with the paste. The acidified solutions are to be markedly thinned and diluted in order that no inflammatory reaction on the part of the skin follows. When properly done, this procedure is at least as good as, and often far better, in its results on the circulation and heart, than the bathing with natural carbonic waters at Nauheim itself.

Treatment of Hysteria.—In the *Indian Medical Record* of Calcutta (January 10, 1900) Surgeon Major R. E. Wrafter of Dehra Dun recommends certain procedures in the treatment of hysteria. The first object is the relief of the patient during the actual paroxysm. If the attack be severe and protracted care is to be taken that the patient does not injure herself. Cold water to the face, fresh air, rubbing the temples with spiritus ætheris comp., are often effectual to stop the paroxysm. It is usually impossible to give medicine by the mouth, as the teeth are either tightly shut or the power of deglutition is lost. Should it be possible, however, it may be advisable to give internally a mixture of spirits chloroformi, spirits ætheris comp., and aqua camphoræ together with tinct. lavendulæ comp. If this cannot be done, an enema of ol. terebinthinæ or tinct. asafœtida may be employed to cut short the attack. In the interval between the attacks, internal medication may be employed to advantage. The indications are to allay the excitability of the nervous system and to improve digestion. In plethoric patients, cathartics, low regimen and regular exercise are useful. In languid patients, tonics are indicated. Myrrh, bromide of potassium and cinchona, a course of mineral waters, daily exercise, tepid bathing, and generous diet will prove very efficacious as adjuncts in the treatment. Aromatic distilled waters are useful as carminatives where flatulency is present. Hysterical patients should never be roughly treated and above all, the physician must always be careful

that no other disease coexist. Some management of the mind looking to its greater stability is also very useful when properly carried out. A woman can often by well-timed firmness on the part of the practitioner, resist the tendency to an attack. In cases of hystero-epilepsy of the ovarian type, the attacks can be arrested at any stage by forcible pressure on one or the other ovary. It is extremely difficult, however, to recognize these cases and to distinguish them from pure epilepsy.

Predetermination of Sex.—This has been a most interesting subject of discussion in the medical journals since the publication of the theories of Dr. Schenck, founded on the belief that the ruling factor was in the kind and amount of food which the mother partook during gestation. A new theory which claims to have been proven in practice is now advanced by Dr. J. G. Davis (*N. Y. Med. Jour.*, Feb. 24, 1900) who reports that she has during the past twenty years been able to predetermine the sex in all cases where an attempt was made, provided her rules were followed. Two failures were easily explainable and aid in proving her theory. The monthly cycle is divided into three parts; one, from three days previous to menstruation until eight days after the cessation of the flow, during which time only girls are produced; second, from the eighth to the tenth day after menstruation, when either boys or girls may be produced; third, from the tenth to the fifteenth day, when only boys may be conceived. During the remaining period she believes a woman to be practically immune to the dangers of conception. In her experiments she has further noticed that when impregnation occurred on the eighth or ninth day, besides the sex being indeterminate, a boy would oftentimes be somewhat effeminate and a girl rather masculine in her characteristics. Thus by the mere practice of self-denial or absolute continence for a certain number of days, the sex of the offspring may be easily predetermined, and happiness brought to many otherwise dissatisfied homes. She founds her theory on the belief that the vibratory law of Nature governs this phenomenon as well as all others, and that the rate of vibration in the female which is higher during ovulation and lower at other times will cause the conception of a girl or boy respectively, according to the vibratory condition in which the mother happens to be at the time of impregnation.

Gastric Ulcer.—Cases of gastric ulcer are, no doubt, frequently diagnosticated as chronic gastritis on account of the similarity of symptoms, but largely due to the lack of a thorough examination of the patient. B. Reed (*Internat. Med. Mag.*, Feb., 1900) points out the important diagnostic features. The three cardinal symptoms are, pain, hemorrhage, and circumscribed tender spots. The pain, as a rule, begins soon after the entrance of food into the stomach and often remains until vomiting occurs, or until the food has been passed on to the intestine. The fact that the pain is absent when the stomach is empty and much less when liquid food only is taken is almost diagnostic. The hemorrhage may be observed by the vomiting of fresh blood, or dark changed blood, or by the passage of tarry stools. Marked circumscribed tenderness in the epigastrium just below the ensiform cartilage and to the left of the median line, and also on the left side of the spine over the origin of one of the last three ribs, is a most constant symptom. Vomiting of food after eating is seen in so many diseases that it is of less diagnostic value. Vomiting usually occurs from one-half to two hours after eating and is followed by cessation of pain. This distinguishes it from carcinoma. An almost constant excess of hydrochloric acid is one of the important corroborative signs of gastric ulcer. The appetite is usually good and may be excessive. Marked anemia is frequently present. The most liable complications are (1) fatal hemorrhage; (2) perforation with localized or general peritonitis, or (3) a subphrenic abscess.

Peripheral Neuritis and Arsenic.—In the *Medical Chronicle* (February, 1900) F. C. Railton has reported four cases of chorea treated by arsenic at the Manchester Clinical Hospital in which serious symptoms of paralysis developed. The ordinary toxic symptoms of stomach trouble, diarrhea, puffiness of the eyes, etc., were noticed in only one of these cases, and the paralysis, which affected the lower extremities principally, came on gradually several days or even weeks after the cessation of treatment and in most cases after the return of the child to its home. All the cases eventually recovered after a very protracted convalescence. On account of the slow elimination of arsenic from the system, he concludes from a wide experience, that an aggregate of 6.3 grains of arsenious acid, even when distributed over a period of three weeks, is sufficient to produce peripheral neuritis in a child.

Parasitic Skin Diseases.—When an antiparasitic drug is applied to the skin in strengths sufficient to be efficacious there is always danger of causing a most annoying dermatitis. G. J. Bucknall (*N. Y. Med. Jour.*, Feb. 24, 1900) points out that in the treatment of parasitic skin lesions, three principles must be observed; first, external irritation, or injurious agents must be avoided; second, substances which cause a roughening of the epidermis should not be used, but a softening agent employed; third, antiparasitic drugs able to destroy the organisms must be thoroughly applied. He believes that these cardinal principles are embodied in a drug—sapodermin—which he has used in a one-per-cent. ointment on many cases of scabies, furunculosis, pediculosis and idiopathic alopecia with most favorable results. This is an albuminate of mercury which has been considered theoretically to be inert, but is found to be highly antiseptic and leaves the skin in a soft, pliable condition.

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SATURDAY, MARCH 3, 1900.

PLANT OILS AS FOOD.

THE importance of fat as an ingredient in the human diet needs no restatement. Only too often, however, it is found that individuals who have most need for fats have not the slightest taste for them in the ordinary forms in which they are prepared for consumption, amounting in some instances to positive aversion. But in these cases fats and oils may be taken not only readily, but with positive pleasure. In the warm countries where the disinclination to animal fats is apt to be pronounced, the plant oils, such as olive oil and the various nut oils, are usually favorite articles of diet.

The possibilities latent in vegetable oils as an article of diet are not utilized, especially in this country, to an extent proportionate to their merits. Theoretically we may admit that plant oils are of the greatest nutritive value, but do not realize the practical importance of this fact.

Fat is a substance elaborated by cellular activity in living organisms. Whether the cell that accomplishes the production of the fatty material from indifferent elements, or collects it little by little from the nutritive material supplied to it, be plant or animal, the process and its result are biologically equivalent. The protoplasm of the plant cell is to all intents and purposes exactly the same as that of the animal cell. Analyzed, chemically, after the death of the cell, they are found to be made up of the same substances. It is no wonder, then, that the various products of their activity should resemble each other. Plant oils and animal fats have, it is true, certain characteristic qualities in which they differ from each other. Certain members of the plant series of fat compounds are, however, much more nearly related to certain animal fats than they are to other members of their own series; and, on the other hand, many animal fats resemble others of their own series much less than they do the plant oils. The more fluid fats contain a larger proportion of olein than do the harder fatty substances which are rich in palmitin and stearin. The yellow fats are richer in olein than are the white fats, which owe their color mainly to stearin. Human fat is much richer in olein than most other animal fats and for this reason approaches more nearly many of the vegetable oils.

Clinical experience has shown how beneficial for human consumption are the fish oils, which are also rich in olein. The product is, however, expensive and its preparation for table use requires most careful precautions, as it may have associated with it a number of undesirable substances that make it unpalatable and indigestible, especially for the delicate stomachs of the patients who most need it. The vegetable or plant oils are not open to these objections. Moreover, they can be obtained very cheaply. Modern manufacturing enterprise has made it possible to obtain certain of them in a perfectly neutral state, and much cheaper than even the ordinary animal fats. There seems every reason, then, that their use in the family should be encouraged as much as possible. They represent a most desirable addition to the domestic economy of the modern household, a cheap, clean, eminently nutritious and wholesome fat. This is especially fortunate at this time when fats are not being sufficiently used in the daily dietary.

THE ETIOLOGY OF CANCER.

WE published April 1, 1899, an article by Dr. Roswell Park on the increase of cancer. In this he showed from statistics that malignant disease is every year, throughout the civilized world, claiming more and more victims, and that it has become more of a scourge to humanity than prac-

tically all of the infectious fevers taken together. The increase in the cancer mortality is more than balanced by the decrease in the death-rate from tuberculosis. These concrete statements of Dr. Park very naturally came to the medical world somewhat as a surprise. It had been the custom to think of cancer as an awful, but comparatively rare disease, irretrievably fastened upon mankind, but with no tendencies to vary in its virulence. The discussion that followed Dr. Park's paper, however, has been of great value in establishing more positively his statements. (See p. 324.) There seems to be no possible room for doubt that cancer is very seriously on the increase. If the statistics available on the subject mean anything, this is the undeniable lesson they teach. There are considerations, such as the use of better diagnostic methods and the more careful preparation of mortality reports, which lessen somewhat the force of the deduction from the appalling increase in the death-rate from cancer, but they do not explain it away. On the contrary, they serve to emphasize the fact that the increase of cancer is real, not apparent.

In addition to this increase in the number of cases, there are other striking facts with regard to the affection which have been brought out forcibly during recent years. One of these is that cancer is occurring at an earlier average age than was the case twenty years ago. A number of prominent European clinicians have called attention to this. It is a favorite teaching of Wölffler of Prague, who insists on the greater frequency of cancer, especially of the digestive tract, between the ages of twenty and thirty than was formerly the case. Nothnagel of Vienna is also very strongly of this opinion, and quotes the authority of Billroth, who, shortly before his death, expressed a similar conviction. French surgeons and internal pathologists have also insisted on this same observation.

Another characteristic of cancer that is being widely acknowledged is its tendency to occur by preference in certain localities. It has been pointed out that just as there are "consumption houses" so there are "cancer houses," dwellings in which deaths from this disease occur much more frequently than in neighboring houses. After a death from cancer in a particular house the family in which it has occurred may move out, and one of their successors in the house, in whose family no history of cancer exists, will suffer from the same affliction. When this idea was first advanced with regard to consumption it was scouted as utterly improbable. It is now generally accepted and the acceptance of a like conclusion for cancer houses seems to be one of the coming ideas in medicine. Not only are houses infested with cancer, but special localities somehow seem to favor its development. Certain villages show an undue proportion of cancer patients, and certain streets have become noted for the disproportionate occurrence of cancer along them. There are regions that undoubtedly have the unenviable distinction of being especially liable to the scourge. The work of what may deservedly be called the Buffalo school in the pathology of cancer has served to demonstrate that extreme western New York is one of these distictively unfavored regions.

It is very appropriate, then, that from this part of the country should come some of our most noteworthy advances in the knowledge of malignant disease. The recent report of the New York State Laboratory for the Investigation of Cancer, at Buffalo (see p. 358), shows that with the increased facilities afforded by State aid the good work of advancing our knowledge of cancer is to continue with even greater enthusiasm and the promise of still greater success. The details of the past year's work, as given before the New York Academy of Medicine, shows that the task of investigating the etiology of cancer has, for the first time in this country, been taken up in a thoroughly methodical way. The results so far have been most encouraging. The production by inoculation, with cancerous material from an internal cancer, of a true adenocarcinoma of the mamma in an animal marks an epoch of the American investigation of cancer. The observations and demonstrations of Italian and English experimenters have been successfully repeated at the Buffalo laboratory and everything is in readiness now to advance step by step to ultimate logical conclusions. The blastomycetes theory of the origin of cancer takes on a new lease of life in the light of these successful investigations. The recent observations of Sanfelice have identified the yeast-cells, which in his theory are supposed to be the cause of cancer, with the spherical bodies described by Russell and known as Russell's fuchsin bodies, and probably also with the appearances seen more recently in cancer specimens by Plimmer. This unexpected connection brings out these varied observations with striking force. It serves, too, to show that the investigation of a problem like this from different stand-

points and in different countries may prove of the utmost importance for its ultimate solution. The recent American observations cannot but prove of the greatest service in further elucidating the obscurities that inevitably remain in so involved a question.

The subject is of transcendent importance. The knowledge that cancer is on the increase, that it is occurring in successively younger patients and that it is endemic as well as epidemic, emphasizes the supreme desirability of the most patient investigation of its effective and predisposing causes. There seems every reason to think that American enterprise and inventive ingenuity may prove successful in the solution of a problem that has so far puzzled the medical world.

ECHOES AND NEWS.

NEW YORK.

Yellow Fever at Quarantine.—The steamer "Homer," from Santos, January 31st, via Bahia and St. Lucia, laden with coffee, arrived at quarantine February 24th and reported yellow fever on board, two deaths having occurred on the voyage. One of the victims was a fireman, who died February 5th, and the other a mess-room steward, who died February 9th. Both victims were buried at sea.

Contagious Diseases.—The following cases were reported during the week ending Feb. 24, 1900: Measles, 896 cases and 60 deaths; diphtheria, 285 cases and 50 deaths; laryngeal diphtheria (croup), 17 cases and 14 deaths; scarlet fever, 195 cases and 17 deaths; smallpox, 2 cases; chicken-pox, 24 cases; tuberculosis, 207 cases and 176 deaths; typhoid fever, 25 cases and 10 deaths; cerebrospinal meningitis, 5 deaths. Totals, 1651 cases and 332 deaths.

Doctor and Driver Censured.—The driver of the New York Hospital ambulance which ran over a woman, as narrated in a recent issue, was censured by a coroner's jury on February 19th "for failing to bring his horse to a standstill in time to avoid such accident." And the examining physician at the hospital was censured "for failing to make a thorough examination of deceased before sending her to a ward." The woman sustained a fracture of the skull and other injuries, which resulted fatally.

Obituary.—Dr. James L. Watson died in the Homeopathic Hospital in Brooklyn on February 21st, aged seventy years. He was the last surviving member of the old City Guard of Brooklyn, which was merged into the Twenty-third Regiment. He was graduated from the Pennsylvania Medical College. He served as surgeon in the Civil War and was for some time surgeon-general of the Grand Army of the Republic.—Dr. Joseph M. Creamer died at his home in Brooklyn on February 23rd, in his sixty-fifth year. He was a coroner from 1893 to 1895.

The Congress of Tuberculosis.—The first Congress of Tuberculosis under the auspices of the Medico-Legal Society of this city was opened with a dinner at the Hotel St. Andrew on the evening of February 23rd. The organization of the Congress followed the dinner with Dr. Roberts Bartholow of Philadelphia as Honorary President, Dr. A. N. Bell of Brooklyn as President, and fourteen other physicians as Vice-Presidents. Dr. Charles Denison of Denver is Secretary and Treasurer. Clark Bell, President of the Medico-Legal Society, presided at the dinner.

The Veterinary College.—Recently the American Veterinary College became a department of the New York University and Bellevue Hospital Medical School. A bill has been introduced into the Legislature adopting this department as the State Veterinary College for the Eastern Division of the State. Provision is made for its support by an annual appropriation of $25,000. The State reserves the privilege of sending to the college for instruction, without tuition fee, any designated student who has lived for at least one year east of a line drawn from Port Jervis to Utica, and thence to Ogdensburg, this section of the State being thus designated as the Eastern Division.

Incineration of Garbage.—Dr. Alvah H. Doty has prepared a report in which he favors the passage of the Wagner-Doughty bill for the incineration of the city's garbage. This bill was set before the Senate Cities Committee, at Albany, on February 20th. Dr. Doty states that by the present method of incineration in use in San Francisco, Montreal, Hamburg, Berlin, Bradford, Leeds, Edinburgh and other cities, the garbage, mixed with ashes and other household refuse, can be incinerated for from twelve to sixteen cents a ton. The gases which are formed during the incineration are returned to the fire and destroyed before they can reach the outer air. The small amount of smoke emitted from the chimney is in no way regarded as a nuisance. The process may even be made a revenue-producer. Dr. Doty considers that a number of disposal stations should be situated in different portions of a large city. For this purpose the city should be divided into districts, each having its own disposal works.

Dr. Backus Sustained.—The Board of Managers of Long Island City Hospital have put on record, by a series of resolutions the keen dissatisfaction felt by the Board on account of the failure of Governor Roosevelt to reappoint Dr. Backus as superintendent of the hospital. The Board loyally endorses all of Dr. Backus' official acts, and declares that the method of procedure through which Dr. Backus was retired from the office as manager should be a disappointment and

discouragement to all honorable and manly State officials who give their time and energies in furthering the philanthropic enterprises of the State without reward of any kind whatever, except that which comes through the pleasure of personal identification with good works and the promptings of a right conscience. Against the continuance of such methods the Board respectfully and earnestly protests.

Gov. Roosevelt has relented and appointed Dr. Backus to membership in the Board in place of a member who resigned.

Recovery from Broken Neck.—We recently reported the recovery of a hod-carrier from a broken neck at a hospital in Yonkers. We have now to report the promising convalescence of a gentleman who sustained a fracture of the fifth cervical vertebra in August last while diving off his yacht into shallow water. The X-ray disclosed the fact that the fractured vertebra was pressing heavily against the spinal cord. In September last an incision was made and the laminæ of the fifth and sixth cervical vertebræ were removed. The cord itself was not interfered with, but remained slightly dislocated. At the time of the operation the patient had neither motion nor sensation below the point of injury, indeed, the operation was done without an anesthetic and without any sensation on the part of the patient. There has been slow but gradual improvement in the patient's condition since the operation, and on February 25th he sat upright for the first time in an invalid chair and was able to propel himself about the room. Only certain movements of his fingers and entire mobility of his lower limbs are still uncontrolled by his will. The operation was done by Dr. Abbé at St. Luke's Hospital.

PHILADELPHIA.

Germantown Hospital.—An autograph book sale for the benefit of this hospital has been in progress for several days and a large fund is being raised. A biography of Admiral Dewey, which contained his autograph, was sold for $100, "Richard Carvel" brought $115, and Dr. S. Weir Mitchell's "Hugh Wynne" ran up to $25.

Health Report.—Deaths in the city for the week ending February 24th were 445, a decrease of 58 from the previous week and a decrease of 194 as compared with the corresponding week of last year. Contagious diseases: Diphtheria, 86 cases, 19 deaths; scarlet fever, 56 cases, no deaths; typhoid fever, 110 cases, 15 deaths. Typhoid fever is steadily increasing.

Death from Hiccoughs.—A well-known yet mysterious man in the person of H. H. Greyson died from the above cause, at the Pennsylvania Hospital, February 25th. Letters showed him to be the personal friend of Cecil Rhodes, Gen. Miles, and Gen. Wheeler. He had been postmaster at Manila and had been recommended for the Victoria Cross by Col. Baden-Powell. Nothing was left to tell of his birthplace or relatives.

Representation Asked by Women.—A committee of the students of the Women's Medical College has sent a petition to Mayor Ashbridge asking that that institution be represented on the examining board of the Philadelphia Hospital, saying: "Since our graduates are admitted to the examination for the position of resident physician in the Philadelphia Hospital, and since the other leading medical schools are represented on the Examining Board, we would respectfully urge a similar recognition for our College.

Rights of Christian Scientists.—The adherents of Christian Science in Lackawanna county are making a strong fight to extend their iniquitous practises. The little child of a business man in Scranton recently died from diphtheria after being treated by exponents of the faith cure. The parents then secured a regular practitioner to issue a death certificate and when the Coroner prepared to hold an inquest the Court was asked for an injunction to restrain him from so doing. The injunction was refused. A bill in equity has been filed, and the matter will be pushed to a decision.

Concession to Literary Colleges.—At a recent conference between the Medical Council of Pennsylvania and a committee representing the college presidents of the State the following action was taken by the Council:

"*Whereas*, the Act of Assembly requires that applicants must have pursued the study of medicine for at least four years, including three regular courses of lectures, in different years, in some legally incorporated medical college or colleges, prior to the granting of said diploma or foreign license; therefore, be it

"*Resolved*, that in the judgment of the Council, when the medical course of the literary college, as proven by the examination of the student by the medical college, covers the entire work of the first year of actual medical study, such course may be accredited by the medical college as the first year of medical study required by law."

Pennsylvania Hospital Clinic.—The patient suffering from post-typhoidal insanity, mentioned in our letter of last week, was shown by Dr. J. M. Da Costa February 24th, entirely recovered except for a slight degree of sleeplessness at night. The treatment consisted in forced feeding, stimulation by three ounces of whiskey daily, and the use of strychnine and syrup of hypophosphites. Statistics show that of 1288 cases admitted to the insane department of the Pennsylvania Hospital since 1883 there were only nine cases following typhoid fever. This includes only males. Of females the number was still less, the percentage being but one-tenth of one per cent.

Dr. Da Costa has collected more than a dozen cases of a not generally recognized type of simple continued fever. The average duration is from seven to ten days, the fever subsiding rapidly. A case or two has lasted as long as an attack of typhoid fever. The disease is believed to be fre-

quently mistaken by practitioners for influenza or abortive typhoid fever, although it is neither. The cause is probably a special bacterium or ptomaine, although investigations being made along this line have as yet failed to detect such specific cause.

College of Physicians.—At a meeting of the Section on Ophthalmology, February 20th, Dr. G. E. De Schweinitz reported a case of foreign body imbedded in the choroid for 18 years. No trouble was caused until three months before the patient presented himself. Then iridocyclitis was set up, and sight was nearly lost when the man was seen. Enucleation was done. The vitreous was found to be thin as water. An interesting query is what started the iridocyclitis at that particular time.

Dr. W. C. Posey presented a paper upon "Mental Disturbances after Operations upon the Eye," with the report of some twenty cases. Delirium, with hallucinations and ideas of persecution, was met with. A careful study of the causes was made. In nine cases in which both eyes were bandaged the bandage was removed from one eye when the symptoms began, but this was followed by no improvement. A predisposition to mental unsoundness as a cause was found to have no foundation in these cases, nor did the use of atropine or cocaine. The withdrawal of food and autointoxication were also eliminated from the list of possible causes, as sufficient nourishment had been given and the bladder and bowels carefully watched. The conclusion reached was that the cause in such cases is largely psychical and is due to preoccupation of the patient prior to and after the operation. The hope of having sight restored, the intense desire to help the operator by doing as he wishes, the rest and quiet brought by bandaged eyes after the operation—all these are intense and cause the disturbed mental state. A discussion of the subject showed a strong tendency among the members of the Section to attribute much of the trouble to the bandaging of both eyes.

CHICAGO.

Will of Dr. Holmes.—According to the will of the late Dr. Edward L. Holmes, recently filed for probate, an estate valued at $75,000 is to be divided among the relatives of the deceased.

Advice for Physicians.—The Chicago Health Department has issued a pamphlet for distribution by physicians, which contains advice regarding the importance of absolute isolation of cases of infectious disease. It calls for perfect ventilation of sick-rooms; the closing of all entrances save one; and the hanging of sheets wet with disinfectants over them is urged.

Mortality Statistics.—There were 504 deaths recorded during the week ending February 17th, being 27 fewer than the preceding week and 100 fewer than the corresponding week of 1899. Pneumonia claimed 105. Mortality from typhoid fever remains remarkably low. There were 567 births recorded during the week, an excess of 63 over deaths. There were 8493 pupils examined in the public schools, and 371 were excluded for fear of conveying contagion to the other pupils. Two hundred and fifty-two cases of contagious diseases were reported and 18 funerals of persons dead of sontagious diseases were supervised.

Chicago Surgical Society.—At a meeting held Tuesday, February 20th, the following officers were elected: President, Dr. John E. Owens; vice-president, Dr. D. A. K. Steele; secretary, Dr. Daniel N. Eisendrath; treasurer, Dr. S. C. Plummer; council, Dr. John B. Murphy, Dr. E. Wyllys Andrews, and Dr. L. L. McArthur.

Dr. A. E. Halstead presented a case of popliteal aneurism treated by ligation of Hunter's canal with subsequent incision of the sac. On January 18, 1899, under ether, the femoral artery was exposed in Hunter's canal and ligated with a double catgut ligature. The wound was closed and sealed with a collodion dressing. After this operation the pulsation immediately ceased in the aneurism, the leg was elevated, and external heat applied. In the course of a few days the aneurism became very hard, but still the pain and edema of the leg continued. Three weeks after the ligation of the femoral, when the danger of necrosis was considered passed, the aneurismal sac was opened and the clots turned out. The cavity was lightly packed with gauze and the wound allowed to heal by granulation. No hemorrhage occurred. The patient left the hospital one month after the second operation. His leg is in a good condition, the only effect of the aneurism being a slight flexion at the knee-joint.

Chicago Medical Society.—At a meeting held February 21st Dr. E. R. Le Count exhibited specimens and lantern-lides illustrating the pathology of medical affections of the kidney.

Dr. N. S. Davis, Jr., read a paper on "Diet in Nephritis," in which he said that nephritis can be produced experimentally by swallowing, inhaling, or otherwise introducing into the blood certain chemicals which are renal irritants, and which must be eliminated by the kidneys. Cases of Bright's disease of this origin are rare. Physicians occasionally see such poisoning by turpentine, mercury and lead. As a rule, however, the cases are due chiefly to infection and the elimination of toxins by the kidneys. The influence of overeating and on injudicious eating in producing chronic nephritis is so generally appreciated that it scarcely needs discussion. Chronic diffuse nephritis, like acute nephritis, is most often due to infection.

When a case of acute nephritis first comes under treatment it is best to enjoin rest in bed, to withhold all food for twenty-four or thirty-six hours, to give water freely and to empty the alimentary canal by provoking purgation. Milk should then be given, at first in small quantities, at intervals of two hours. The quantity must be increased gradually until two quarts are taken

daily. Milk is especially adapted as the sole diet of those who have acute nephritis because it more perfectly meets the demands of the system than any other single article of food. Intolerance of milk is often lessened or removed if, when a milk-diet is begun, it is administered in very small amounts, one or two ounces at a time, for example, and the amount is slowly increased. Milk, moreover, is less likely to produce gastric distress if it be sipped instead of being drunk rapidly. All things considered, it is the universal judgment of the profession that there is in this disease no substitute for a milk-diet. When the urine becomes copious and the amount of nitrogenous matter voided in twenty-four hours, all that can be expected, farinaceous foods may be prescribed in addition to milk. In a few days some of the sweet fruits and simpler vegetables can be given. When albumin disappears from the urine an egg can be tried. During the time that albuminous foods are being added to the patient's dietary, close watch much be kept upon the effect of it, the quantity of urine, the amount of daily nitrogenous excretion, the amount of albumin and number of tube casts, if any, found in the urine. When an egg can be taken without harm, white meats can be tried, such as the breast of squab and chicken, a small piece of boiled ham, or perfectly fresh fish. Red meats, rich in extractives, should not be eaten until recovery is established.

In chronic diffuse nephritis, there are the same indications for a milk-diet as in acute nephritis. It is, however, so prolonged a malady that an exclusive milk-diet cannot be maintained continuously. Interstitial nephritis is so chronic a malady that an exclusive milk-diet, even if it were necessary, could be maintained only for a small portion of its entire course. Zasiadko of St. Petersburg administered to ten patients, suffering from chronic nephritis, a vegetable diet for ten days, for a like period an animal diet (with a little bread added), and for another equal period of time a mixed diet. While upon a vegetable diet the amount of albumin in the urine lessened, arterial tension diminished, dropsy increased, the pulse became slower, weaker and softer, appetite failed, the patients became weaker and more apathetic. While upon animal food albumin increased in the urine, arterial tension rose, edema lessened, the pulse quickened and grew fuller, the patients became stronger and more cheerful. The effects of a mixed diet were midway between these. Alcoholic is looked upon as contraindicated in renal affections by the majority of clinicians. It is a renal irritant.

GENERAL.

Obituary.—Dr. H. R. Allen, a millionaire, widely known as a benefactor of crippled children, died while undergoing an operation at the Presbyterian Hospital, in Chicago, on February 13th. Several hundred crippled children, who had been treated by Dr. Allen, gathered in his offices in the Masonic Temple, in Chicago, to look upon his remains.

Conditions at Ladysmith.—A correspondent who escaped from Ladysmith February 10th reports that the continued diet of horse- and mule-flesh was getting somewhat monotonous although the health of the camp—taking everything into consideration—was better than could be expected; enteric fever and dysentery had abated, camp fever was slightly increased, but was not virulent. A local factory was turning out excellent horse sausages and another was making nourishing soup, which was much appreciated by the troops. The total number of men within the British lines was 17,000, all of them troops except 3000 civilians and 800 blacks. The live stock on hand included 4000 horses, 700 mules and 650 head of cattle. If there is sufficient forage for the live stock the danger of famine is certainly far off.

Denver's Consumption Victims.—The annual report of the Health Department of Denver, Col., shows that there were 536 deaths from tuberculosis during 1899, which were 31 more than during 1898 and 47 more than during 1897. Of 489 deaths from consumption in 1897, 88 were of patients who had contracted the disease in the State, and of this class there were 99 in 1898 and 58 last year. The increase in the number of deaths from consumption is attracting attention and a discussion of the situation occupies most of the space this year in the report of the State Board of Health. Already the danger from infection in the larger cities makes doubtful the wisdom of receiving patients in Denver, and the State Board calls for the immediate enactment and enforcement of drastic sanitary legislation.

Prenatal Injuries.—The Supreme Court of Illinois has handed down a decision in the case of an infant against St. Luke's Hospital, Chicago, in which it was sought to recover damages sustained by the plaintiff previous to his birth. Shortly before the birth of the child the mother was in St. Luke's Hospital, and while being transferred from one floor to another her left leg was caught in the elevator and crushed. When her child was born his left side and left leg were paralyzed and deformed. The mother settled with the hospital authorities on her own account and then brought suit for the child. The Court holds that at the time of the accident the child could not be credited as a separate being capable of sustaining an action independent of the mother. "If action can be maintained," it says, "it necessarily follows that an infant may maintain an action against its own mother for prenatal injuries."

The Sander Prize.—Rules for competition for the Gold Medal of the value of $100, dedicated by Mr. Enno Sander of St. Louis, for the best paper on "Military Surgery," presented at the Annual Meeting of the Association of Military Surgeons of the United States, are as follows: (1) Competition to be open to all members of the Association. (2) Each competitor shall send three copies of his essay, in a sealed envelope, to the Secretary, Lt.-Col. Chas. Adams, Central

Music Hall, Chicago, Ill., on or before April 15, 1900. The usual arrangement for secrecy regarding authorship will prevail. (3) The committee will designate the essay worthy of the prize, and also in their order of merit those deserving of honorable mention. Should the Committee deem proper, it may recommend neither prize nor honorable mention. (4) The successful paper shall be published in the Transactions of the Association.

Dr. Keeley Dead.—Dr. Keeley, the inventor of the "Keeley Cure" died at Los Angeles February 21st. The career of Dr. Keeley and his remarkable propaganda is one of the peculiar medical anomalies of the closing years of the century. Dr. Keeley in treating the mania for alcohol as a disease introduced nothing novel to medicine. On the contrary, he applied to the treatment of these cases a well-recognized method. Unfortunately, he threw about it a cloak of secrecy and tainted it with humbug and quackery, and brought it into prominence as a great financial scheme. Although at first it was attended with remarkable success, the financial feature proved its undoing. It must be admitted, however, that the Keeley cure has probably served a valuable purpose in disseminating among victims of alcohol a wide recognition of the fact that they are the victims of a disease. It has also indirectly promoted temperance by warning people of the danger of contracting an uncontrollable mania. As the vogue of the cure has gradually passed away, it has been replaced by methods of treatment having a reputable medical standing and supplied by regular practitioners.

The Plague.—The reports of the suppression of the plague at Honolulu, as stated last week, have been confirmed by despatches dated February 22d. Unfortunately, however, the disease has been introduced in the island Maui. This is one of the Sandwich Islands on which the immense sugar plantations are situated. The seven cases of plague discovered here were in the town Kahului which is the port of entry of the island. They all proved fatal, the victims being Chinese or Japanese. The same radical measures were adopted that had formerly been employed at Honolulu. A detention-camp was established and a careful inspection of all persons who had been in that section of the port known as Chinatown was instituted. Chinatown was then destroyed by fire. Investigation by the Board of Health showed that the disease was introduced to Maui through New Year delicacies imported from the Orient. On the day that these goods were opened the disease appeared. An effort is now being made to trace the remainder of this consignment. Three of the crew who handled the goods on the steamer which brought them were among the victims. One case has appeared at Hilo, which is the only port at which our transports from the Philippines have called since the outbreak at Honolulu.

The plague in India continues virulent. There were 583 victims in Bombay during the week ended February 16. With over 61,000,000 people affected by the famine and only about 4,000,000 in receipt of relief, India seems in bad plight, though the death rates over the 550,000 square miles of the famine area are decreasing. The Indian Government has issued a proclamation approving Professor Haffkin's anti-plague inoculation, and the Viceroy, Lord Curzon, is advocating its use throughout India.

Medical War News.—The following extracts of the diary of a correspondent at Kimberley give a striking picture of the hardships endured:

January 11.—Scurvy attacks the natives alarmingly. They are dying fast. The antiscorbutics are exhausted. Vine-cuttings are being tried in lieu of green food.

January 12.—Typhoid is very prevalent. Neglect to boil the water is the probable cause.

January 13.—Fifty typhoids in the hospitals.

January 16.—The military authorities have commandeered all the foodstuffs and other stores. Leave has been granted to the inhabitants to shoot small birds for food.

January 17.—The mules slaughtered are pronounced superior to horseflesh.

January 24.—Five hundred shells poured into the town, at haphazard, the hospital, scurvy-compound and residences receiving the attention properly due the defenders of the earthworks.

January 25.—A small family shellproof shelter has been dug in nearly every garden.

February 11.—Twenty-five hundred women and children were lowered into the mines throughout the night. The men are also selecting places of safety.

February 15.—Relief column arrived.

A well-known surgeon, discussing the character of the wounds received on the battlefields has pointed out that experience of the present campaign seems to show that the only absolutely fatal region is the heart. Bullet wounds of the brain are now not necessarily fatal, judging from the records of the last few weeks, and this is presumably due to the small size of the projectile, the velocity with which it travels, and the modern practice of scientific surgery, by which dangerous symptoms likely to arise from injuries may be warded off. It has, therefore, been suggested that, the heart being the only really vital part in the body, a steel covering should be provided, to be worn so as to protect that part from bullets. A steel plate might be attached to the soldier's tunics, and doubtless the small shield could be so fixed as neither to impede movement nor cause inconvenience.

At a recent medical examination of some Irish volunteers, who offered themselves for service in South Africa, two were found to have very bad teeth. Upon being told that this would be against their acceptance the first one remarked that he did not see why this should be against him because he had terrible hard gums, while the second one

remarked: "I thought we had to shoot Boers, I didn't know we were to ate 'em."

The British War Office for the first time has given out an official compilation of the British losses. The total is 11,208 to February 17th. This does not include, therefore, Lord Roberts' recent losses nor the Wiltshire prisoners. It is learned that the British losses at Koodoosrand were 700. Three thousand fresh troops embarked for South Africa February 20th.

CORRESPONDENCE

A CASE OF SALIVARY CALCULUS FROM THE SUBMAXILLARY GLAND.

To the Editor of the MEDICAL NEWS:

DEAR SIR:—There has recently occurred in my practice a case of unusual interest to me from the fact that it was the first one of the kind that has ever come under my observation.

A young woman, twenty years of age, had complained for three days of pain upon movement of the tongue and jaws, and of a swelling underneath the tongue on the left side. On examination I found a lymph node, enlarged, tender, and movable, in the left submaxillary region. A portion of the sublingual gland of the same side was also swollen, and there was a decayed molar tooth in the lower jaw on that side. No digital examination of the mouth was made. The patient had had a mild attack of influenza during the previous week and it was thought that some infective process had been lighted up in the root of the decayed tooth.

The following day the inflammatory process had progressed, causing increased enlargement of the sublingual gland, the surface of which was excoriated. There was also increased swelling with tenderness of the submaxillary lymph node and induration of the floor of the mouth. There was a free flow of saliva. The speech was thick, and there was inability to open the mouth to any extent. Temperature was 101° F. The condition suggested some slight suspicion of Ludwig's angina.

Suppuration, with spontaneous rupture of the ranula, occurred the same night and a calculus was passed from Wharton's duct. The calculus was $^{11}/_{16}$ of an inch long and $^{3}/_{16}$ of an inch thick at the central portion, tapering to a rounded point at either end. A fine probe passed five days later showed the duct free from further calculi. It is needless to say the patient promptly recovered from her unpleasant symptoms.

S. H. Dessau, M.D.

New York, November 20, 1899.

STATUS OF MEDICAL PRACTICE IN PUERTO RICO.

To the Editor of the MEDICAL NEWS:

DEAR SIR:—It gives me pleasure to give you some details of the practice of medicine as seen in this island.

The physicians in Puerto Rico have been, in the main, educated in Spain, the schools at Madrid, Barcelona, Cadiz, Sevilla, Valencia, Santiago, Valladolid, Granada and Saragoza, all being patronized. There are a few foreign diplomas on the island from the United States, France, Germany, Portugal, Switzerland, Belgium, Cuba, Scotland, Venezuela, Italy, Mexico, and Santo Domingo. From 1846 to the time of the American occupation, over 300 physicians had received licenses to practise in the island. Probably twenty physicians have come in since the occupation.

Those persons who studied in Spain do not commonly possess the title of "doctor," but are merely licensed "licensiado" to practise medicine and surgery. The explanation given for this is that the fees demanded for a diploma were so great poor students could not pay them. The persons who studied elsewhere than in Spain have, however, commonly the doctor's degree. For the registration of a foreign diploma the usual fee was 200 pesos ($150).

Besides the licensed physicians, there is a class of practitioners called "practicantes" or physicians' assistants, men who do the rough work in the mountains and among the poor. These persons are licensed to practise minor surgery, to pull teeth, and do whatever the physician under whom they practise may direct. From 1866 to date, 158 of these persons have been licensed. There are also midwives, called here "comadronas," who are licensed practitioners.

In the palace were registered, not only physicians and surgeons, but also surgeons major, surgeons second-class, surgeons third-class, surgeons, bloodletters, horseshoers, surgeon dentists, surgeon-practicos, surgeon-medico-practicos, medico-practicos, pedicuros.

Puerto Rico has a population of 975,000. There are now about 125 physicians on the island, or 1 to 8,000. The great portion of these are, however, crowded into the towns, leaving the country wholly without medical assistance, for the practicantes, like the physicians, are in the towns also. There are municipalities of from 10,000 to 20,000 population, which have to-day no physicians, because they are unable or refuse to pay for medical assistance for their poor.

The system has been as follows: Each municipality employs on a yearly salary one or more physicians to attend the poor. These physicians, if need be, give their whole time to the care of the indigent sick. Medicines are also provided by municipalities for the poor. Now it has come about, in time, that *all the people feel that they should have free medical treatment and free medicines.* The poor, because the law provides these things for them, and the well-to-do citizens, because they pay the bills. Hence, it follows that the doctor and the pharmacist have little private practise. The salaries paid medical men are miserably small, from 600 to 1000 pesos per year, or from $400 to 500, gold. Things have gone on along these lines, from bad to worse, until at the present time the practise of medicine is completely demoralized.

This is seen in the frequent removals of physicians, often three or four times in a single year. Since the great storm of August probably a score of physicians have abandoned their posts because their salaries have been temporarily stopped, leaving the distressed people wholly without medical assistance.

To look after the interests of physicians there existed under the Spanish Government a board called the Royal Subdelegation of Medicine and Surgery. To this body all diplomas were submitted for examination before a license could be issued for a person to practise medicine on the island. When written, the statement just made was thought to be correct, but it has since been discovered that persons received licenses from the Governor-General. How many of this class were granted is unknown. The considerations on which they were granted are also unknown. The subdelegation of medicine also examined and licensed dentists and practicantes. It settled disputes between physicians and advised the Government in all civil and criminal law-suits where expert testimony was desired. It was not, however, able to place the practise of medicine on a sound foundation in the island.

The subdelegation of medicine and surgery was abolished by General Henry, Military Governor. Its functions are now performed by a Superior (State) Board of Health. This Board is directed to issue a license to each qualified practitioner, respecting all existing rights of those established on the island. The following are the essential points in the order regulating the practise of medicine, pharmacy and dentistry now in force in Puerto Rico.

An examining committee of three physicians, two pharmacists and one dentist, is appointed to conduct examinations under rules formulated by the Superior Board of Health. The members of this committee must all be of ten years' standing and recognized ability in their professions, and all must speak English. The Superior Board of Health appoints the president and secretary of the examining committee. The examinations are all to be in writing. The results are to be submitted to the Superior Board of Health.

Licenses will be issued to the successful applicants by the Superior Board of Health. The fees for examinations are: For physicians and surgeons, $25; pharmacists, $25; dentists, $25; practicantes, $15; professional nurses, $10; midwives, $5.

Persons who violate the order may be punished by both fine and imprisonment.

There are no poorhouses in Puerto Rico, but most municipalities have one or more "hospitals" to which the bedridden poor are taken. They receive little medical attention, almost all hospitals having as attendants practicantes, who often leave their charges nearly uncared for. When a patient dies, the vacant bed is quickly occupied by another waiting unfortunate. These people live uncletesly and die easily. Alive and well one day and dead the next is no uncommon occurrence. Of hospitals, as these institutions are known in the States, there are very few in Puerto Rico, except those belonging to the army.

The mountains of Puerto Rico are extremely inaccessible, roads being almost unknown, but they have a rich soil and are densely populated. For physicians to visit the sick in their inaccessible mountain homes is almost a physical impossibility. Hence, they often die unattended by even a practicante.

In practise the native physicians temporize and use expectant remedies only. This is true of all, no matter where educated. In surgery it is the same way. They do only what is absolutely necessary. Heroic measures are wholly unknown in their practise. With many physicians the treatment is rest in bed with milk or other light diet. With their people, it must be said, they meet with fair success in many diseases. The drugs-stores throughout the island are clean and well-stocked, very creditable institutions indeed.

Christian Science practise has not yet invaded the island, but spiritualist practitioners are numerous. Of these there are two classes. The first receive revelations which aid in diagnosis and treatment from the world of spirits indiscriminately. The second class practise in the names of dead physicians of local repute, receiving from the spirits of the dead doctors very excellent prescriptions, so the people say. To the credit of the established church, these people are outside its membership.

Just now the island suffers from tropical dysentery and anemia, hundreds of persons dying each week of both of these diseases, which, however, confine their ravages to the poor who have but little food, clothing or shelter. The sanitarian meets with the greatest difficulty in his work. After a death it is a custom to hold religious services, for a period of eight days, in the room where the death occurred. No other room will answer the purpose, even in cases of contagious diseases. Many of the poor bathe very seldom and treat open sores with a decoction of urine and tobacco. There are probably 100 lepers on the island, but the disease does not tend to spread. Efforts are being made to collect all these unfortunates into an isolated locality where they can be well cared for.

Ending June 30th, 800,000 vaccinations were performed, and for several weeks past not a single case of smallpox has been known to either the civil or military authorities, showing clearly the possibility of controlling this disease in a Spanish-American country. Not a case of yellow fever appeared in the island all summer, indicating that that disease is not endemic here.

George G. Groff, M.D.
Secretary and Treasurer, Superior Board of Health.
San Juan, P.R., December 25, 1899.

Degenerates Exterminated.—Dr. McKim of New York in a recent book, recommends that the State should consign the hopelesly insane, the degenerate, etc., to a lethal chamber.

TRANSACTIONS OF FOREIGN SOCIETIES.

German.

AORTIC ANEURISM WITH FEW SYMPTOMS—CONGENITAL HERNIA OF THE DIAPHRAGM—NATURE OF RELAPSE—SURGICAL TREATMENT OF RENAL TUBERCULOSIS—FINAL RESULTS OF GASTRO-ENTEROSTOMY—SUBPHRENIC ABSCESS — CARDIAC DYSPNEA AND PULMONARY EDEMA—OPERATIVE PERFORATIONS OF THE UTERUS.

AT the Union for Internal Medicine, January 15th, VON LEYDEN showed the specimen from a patient who had died from aneurism of the arch of the aorta. Curiously, no tumors, pulsation, murmur nor cardiac hypertrophy could be made out during life. There was observed only a paresis of the left vocal cord, followed by attacks of dyspnea and a marked respiratory stridor, due to compression of the trachea. The suspicion of aneurism was confirmed by a radiograph. The normal respiratory murmer was lessened not only on the left side where the pressure was on the bronchus, but also on the right side on account of insufficient inspiration. Seven injections of a solution of gelatin were made, but they had no apparent good effect. Death resulted from suffocation.

BRUSA spoke of a boy aged eight years, who had a congenital hernia of the diaphragm. The left lung was crowded almost out of its cavity by the protrusion into it of many of the intestinal loops, etc.

LIPPMANN discussed the question of relapse. In a five-year-old boy the decrease in size of a cervical lymph gland was followed by a relapse of scarlet fever. There is probably no such thing as a reinfection in scarlet fever, but only relapse starting from some remaining focus. Similarly in erysipelas there often remains a nest of cocci in the lymph channels which may lead to a further outbreak of the trouble. Follicular tonsillitis does not develop after the removal of the tonsils that harbored the germs. In furunculosis the cause of relapse is to be found in the remaining infiltration of the skin. Apparently new infections are often shown to be relapses by the fact that (1) the exanthem appears in the neighborhood of swollen lymph glands; (2) the course of the disease is mild; and (3) it is not the disease itself, but an etiologically allied trouble which develops. The germs of infection may remain encapsulated in parenchymatous tissues for years. Osteomyelitis, for example, may produce new foci after a lapse of decades. Usually the germs are freed from their capsule by a traumatism or an operation, on exposure to cold, or a psychic irritation with increase of blood pressure may suffice for their liberation. Puerperal fever is not always due to germs introduced from without. It may develop from old uterine or periuterine gonorrheal inflammation.

KONIG spoke of the surgical treatment of renal tuberculosis. This disease appears in two forms, *viz.*, either in small solitary nodules of the cortex which are recognized with difficulty, or as an affection of the pelvis of the kidney, which may be recognized without the demonstration of the tubercle bacillus in the urine by a train of symptoms—cloudy urine, unilateral renal pain, flocculi in the urine which are composed of epithelium of the pelvis and pus-cells. Later a tumor is palpable and the patient becomes emaciated and anemic. Resection and drainage are useless procedures. Removal of the whole kidney is the only chance of recovery for a patient having this form of renal tuberculosis. The existence of an opposite kidney must first be determined. Congenital absence of a kidney is associated with absence of the corresponding testicle. Catheterization of both ureters and analysis of the urine are absolutely necessary and entail no risk if properly performed. König has performed nephrectomy 20 times for renal tuberculosis. Twice the diagnosis was erroneous, the smegma bacillus having been mistaken for the tubercle bacillus. Of the remaining 18 patients, 3 died of anuria, and at autopsy the epithelium of the remaining kidney was found to be extensively necrotic. Consequently König no longer uses chloroform upon such patients, and keeps all antiseptics out of the wound. A moderate affection of the opposite kidney, nodules in the prostate or testicles, and disease of the bladder are not contraindications to operation. They tend to disappear when the chief source of infection and irritation has been removed. Six of the 18 patients (12 women, 6 men) operated upon died soon after operation. Eleven were living after periods of two, nine, six, and a less number of years.

LITTEN called attention to a third form of renal tuberculosis, characterized by a general caseation, with obliteration of the ureters. He showed two specimens.

At the Free Union of Surgeons of Berlin, January 8th, MERKENS spoke of the final results of gastro-enterostomy, mentioning 23 cases in which Murphy's button had been used. Six of the 7 patients who suffered from benign stenosis recovered. Sixteen patients were carcinomatous; 5 of them died within a month of the operation; 7 within two months; 8 within three months; 9 within five months; 11 within seven months; 12 within a year. The remaining four patients were alive at the time of report, one having survived the operation two and a half years. Posterior gastro-enterostomy had been performed, without entero-anastomosis and symtoms of a vicious circle had not appeared.

REICHERT showed a patient aged sixty-eight years who had washed his stomach two or three times daily for twelve years on account of dilatation and fermentation. Gastro-enterostomy was performed upon him and in six months he gained twenty pounds.

WEBER examined the records of 600 cases of appendicitis, and found that subphrenic abscess had occurred only nine times 2.15 per cent.).

Seven of these nine patients were operated upon. Three died and four recovered. Such an abscess may follow appendicitis in three ways, *viz.*, the infection may travel upward along the ascending colon, or retroperitoneally, or the appendix itself may lie extended upward.

KAREWSKI mentioned two instances in which subphrenic abscess was due to trauma. Once it followed osteomyelitis of the eleventh and twelfth ribs of traumatic origin, and once it developed in a little girl who had been run over by a wagon. The pus in the latter case was sterile, and in it was floating the necrotic spleen. The abscess cavity was opened through the pleura.

KORTE reported 35 cases of subphrenic abscess, 16 of them being of appendical origin. He prefers the perpleural operation. Twenty-three of the 35 patients were cured. In the pus micro-organisms were always found.

At the College of Doctors, Vienna, January 22nd, V. BASCH spoke of cardiac dyspnea and pulmonary edema. Physiology understands by "dyspnea" the accumulation of increased respiratory stimulus. Clinically in dyspnea there appears to be a disproportion between the respiratory effort and the result. The cause of dyspnea in cardiac complaints is said to be either the irritation caused by the carbonic dioxide or the lack of oxygen. Traube explains it on mechanical grounds by saying that in congested lungs the capillaries are distended and twisted and project into the alveoli and so cause a mechanical obstacle to respiration. As to the result of his experiments, Basch became convinced that the essential factor in cardiac dyspnea is obstruction of respiration. For instance, if a manometer is placed in the trachea and fluid is then injected into the trachea, it is at once evident that the lungs increase in size. If the alveoli of a lung are filled with blood, the lung does not follow the excursions of the thorax as readily as before, for it has become stiffer and larger. Swelling and stiffness of the lung are the real factors of cardiac dyspnea. If a person whose heart is not badly affected remains quiet he can breathe easily, but when he makes some effort the lungs become stiffer and so do not answer the demands made upon them. The feeling that one cannot get enough air is increased to the highest grade in asthmatic attacks. These usually come on spontaneously, but they may be brought on by muscular exercise or excitement. The practical treatment is to give no emetics nor expectorants, but such remedies as will strengthen the heart (digitalis, camphor). Morphine, too, may be of value to lessen the blood pressure and so lighten the work of the heart.

At the meeting held January 29th BRAUN FERNWALD spoke of perforation of the uterus in gynecological operations. Usually the accident occurs during excochleation and the removal instrumentality of placental remains. When one is operating aseptically perforation of the uterus by a sound is not dangerous, and has been doubtless overlooked many times, causing no symptoms. For curetting a large dull instrument is recommended. Placental remains should be removed by the fingers as far as it is possible to do so. The condition of the uterine wall has a great deal to do with the occurrence of perforation. The puerperal uterus, especially if septic, can easily be perforated. The treatment of perforation consists of rest in bed. If there are alarming symptoms in septic cases, it is desirable to extirpate the uterus through the vagina. If a perforation is suspected irrigation must not be used. Bleeding may be stopped by packing gauze into the uterus. If intestine appears through the perforation, laparotomy should be at once performed in order to make sure that the intestine is not injured. In one case there were no less than six perforations, but the patient recovered without any complication.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.—SECTION ON PEDIATRICS.

Regular Monthly Meeting, Held February 8, 1900.

Thomas S. Southworth, M.D., Chairman.

Dysentery from Bits of Wool.—Dr. LaFetra presented a specimen from a child who had suffered from sudden high temperature with diarrhea. The specimen had been obtained from several successive irrigations of the colon. A number of particles of some material resembling absorbent cotton were found in the stool. The mother denied that the child had had the opportunity to swallow any absorbent cotton. She recalled, however, that the child had the habit of picking at the fluffy material of its cradle coverings. Material thus plucked off it would put into its mouth. It is evident that the child swallowed a considerable amount of this material, which collected in the large intestine. During its course through the intestines it set up irritation, interferred with digestion and led to the absorption of toxic substances from the intestinal canal, thus causing the symptoms. When first seen the child had a temperature of 104° F., and it had a convulsion that lasted about five minutes followed by a period of unconsciousness lasting about the same length of time, an hour or so before it was seen. Because of the convulsions the child was treated by a hot pack at first and because of the temperature by a cold pack at 72° F. Shortly after the cold pack was applied an evacuation took place which contained some portions of the cottony material. The rest of the material was then removed by irrigation. Since then the child has been improving. The child had been perfectly well previously and although four teeth were irrupting on one side of the mouth, two upper and two lower, there seems no good reason to

think that this would be sufficient in a healthy child to cause the symptoms noticed.

Carbonic Acid Gas for Whooping-Cough.—Dr. N. R. Norton reported two series of cases of whooping-cough occurring in two different years treated by rectal injections of carbonic acid gas. Out of 150 patients, 143 were benefited to a very noticeable extent. After the injections vomiting ceased and the paroxysms of coughing were less frequent and less severe. The seven cases that were not benefited were of weakling children in advanced stages of the disease. The carbonic acid was obtained from a mixture of bicarbonate of soda and crystals of tartaric acid. By this method the gas is given off sufficiently slowly, so that its administration may be kept up continuously for the necessary length of time. In infants the injections were given for five minutes at a time; in older children for ten minutes. The administration of the carbonic acid gas is followed by flushing of the skin, especially of the face. In a few of the patients mild diarrhea developed. This seemed to be produced by the irritation of the rectal tube. It ceased after a day or two, when the injections were discontinued, and they could usually be resumed a day or two later without necessarily causing the diarrhea. As children suffering from whooping-cough frequently have diarrhea it is doubtful whether the carbonic acid or the method of administering it was the cause of the frequency of stools.

The success of the injections of carbonic acid gas was marked only when the nascent gas was employed, that is to say, when the gas was obtained fresh from the chemical reaction of the bicarbonate of soda and the tartaric acid. In a series of twenty cases, in which commercial carbonic acid gas was used, it seemed to have absolutely no effect on the whooping-cough. By commercial gas is meant that which is obtained in tanks from the manufacturers of soda-water supplies. This does not seem to have the same chemical activity as the freshly prepared gas which acts as if in the so-called nascent state.

Intubation for Whooping-Cough.—Dr. O'Dwyer at the time of his death had been working for some time on the question of relieving severe cases of whooping-cough by means of the laryngeal tube. In some notes that he left on the subject he says that the torture which causes the child to drop its toys and fly to its mother or the nurse when a paroxysm of whooping-cough is about to come on must be felt personally to really be appreciated. He had whooping-cough himself when over forty and said that the spasm of the glottis which accompanies it gives one a sense of intending death which no amount of reasoning can remove. To relieve this torture it seemed to him for a long time that intubation would be effective. For this purpose he suggested, not the metal tube which is liable to calcareous incrustation with the production of sharp, roughened points which irritate the laryngeal tissues, but the hard rubber tube which remains clean and absolutely smooth for long periods. Intubation undoubtedly relieves the spasm. Some time ago at the Foundling Hospital three cases of whooping-cough developed laryngeal diphtheria, and intubation became necessary. It was interesting to watch the result of the intubation on the whooping-cough. There were all the usual symptoms of the expiratory spasm, but no inspiratory difficulties and no vomiting although the children had frequently vomited. It would seem, then, that in severe cases, at least, in which the child's nutrition suffers because of the vomiting, intubation is indicated.

Whooping-Cough in Dispensaries.—Dr. Walter A. Dunckel read a paper in which were discussed all the cases of whooping-cough that have been treated at the New York Dispensary during the past five years. About sixty per cent. of the cases were in females. Fifty-eight per cent. of the cases occurred between six months and four years. Only two of them occurred at three months, and none of the cases were over twenty years of age. The complications usually occurred in children under three years of age. Between the ages of three and four complications were notably less and after five they became comparatively rare. The great majority of the complications occurred from the eighth to the tenth week of the disease. Four of the cases lasted three months, one case lasted four and one-half months, while one case lasted but two weeks. In one case empyema developed and was operated on during the course of the whooping-cough. The paroxysms of the disease seemed to help in the expansion of the lungs. Although the child was so weak that it was feared it would not outlive the operation, it recovered completely. It might be thought that emphysema would develop because of the intense respiratory effort required during the spasm of the glottis. Although it was carefully looked for in all the cases that could be followed for any length of time it developed only in two patients, one boy and one girl. Pulmonary tuberculosis is not frequent after whooping-cough. It seems that the intense expiratory effort after the paroxysm throws the bacilli out of the air passages. The bronchopneumonia seems in many cases to be really tuberculous in character. Notwithstanding this consolidation of part of one of the lungs does not absolutely mean a bad prognosis. A certain number of cases clear up and the children recover. A certain number of cases of cardiac disease develop after whooping-cough, in which the latter disease would seem to be the etiological factor. No endocarditis and no murmurs, however, can be found.

Treatment.—Belladonna given to its full physiological effect seems at times to give good results. Cod-liver oil is of decided benefit. This is especially manifest from the fact that mothers come back regularly to demand the "thick medicine." Antipyrine cannot be used to advantage in dispensary practice. It seems risky to push the drug to the extent to which it must be used to secure good results, except where patients are constantly under the care of a physician. Bromo-

form was not used because of the uncertainty of its mixture and because there was very little confidence in the remedy. Dr. Huddleston while in charge of the dispensary had used bromoform in a number of cases and had never seen any but doubtful good effects from it. As a matter of fact the prognosis in cases of whooping-cough depends largely on the hygiene of the patient's surroundings. Where an abundance of good food, good air, and careful nursing is provided fatal terminations are rare and complications of any serious character occur but seldom.

Comparative Drug Values.—Dr. Chas. G. Kerley read a paper descriptive of a series of efforts to determine by actual observation what drugs were most efficient in the treatment of whooping-cough. The cases were taken in groups of twenty and were allowed to run their course untreated to the acme of the disease. Charts were made of the number of paroxysms that occurred and of their severity. When there was no increase in either the number or severity of the paroxysm for three days the disease was then considered to be at its height and the drugs chosen were administered. The age of the patients varied from three months to twenty-six years. There were only three adults and five-sixths of the cases were under four years. Many cases of whooping-cough in private practice are mild and do not exceed five to six weeks in length. Recently Dr. Kerley has had a boy who had altogether only three paroxysms during the course of the disease, but these were typical enough to make the diagnosis sure. His sister had all the catarrhal symptoms of whooping-cough but did not whoop once. In hospital practice, however, it is no unusual thing to have cases to go on for ten weeks, for three months, or even longer. The observation of the effect of the remedies on these cases seems best calculated to bring out the true therapeutic effects of the drugs if there are any. Vapo-cresolin was tried in ten cases, but did not seem to produce any effect. This drug seems best for mild cases in private practice because of its suggestive effect on nervous parents. Inhalations of turpentine and steam were tried. They seemed to have but very little effect. Alum seemed to be of some service, but had such a bad effect on the stomach that after five days it was discontinued. Fluid extract of chestnut leaves and dilute nitric acid seemed to produce no effect on the disease at all. Bromoform was tried in sixteen cases, but seemed to be of no service. Only three of the cases were relieved and the remaining ones seemed to be absolutely unaffected by the drug. Spraying with cocaine, three per cent. solution, was tried in twenty-six cases. It seemed to be of some value. Quinine when pushed was found to be of great service. Twelve to twenty grains must be used in the twenty-four hours to produce the desired effect. It was very faithfully tried in sixty cases, so that the result seems to be very trustworthy. The drug is not palatable, however, and it is difficult to make it so. When given in this quantity neither chocolate, yerba santa, nor thick syrup succeed in disguising the taste. Their use as vehicles serve but to disturb the stomach. In older children it may be given in capsules. One difficulty of its use in private practice is that parents are apt to object to it if given in the doses it should be to have any effect. Belladonna is recommended by practically all the text-books as a specific for whooping-cough. It was tried in sixty cases to its full physiological extent without the slightest effect. It is a striking lesson in the trustworthiness of text-books, to see a child with typical dilated pupils and the belladonna blush having characteristic paroxysms of whooping-cough. The bromides, given in doses of twelve to sixteen grains daily in raspberry syrup, were found to lessen the severity of the paroxysms, although they did not decrease their number. Antipyrin was used in sixty cases. It controlled the paroxysms both as regards severity and number better than any other drug. In all cases where it was given it caused improvement. Antipyrin is a drug easy to administer. The best effect is obtained by combinations of the bromides and antipyrin. To a child of eight months one-half grain of antipyrin and two grains of bromide may be given every two hours until six doses have been taken. To a child of twelve months, one grain of antipyrin and two grains of bromide may be given every two hours for six doses. To a child of two years, two grains of antipyrin and three grains of bromide may be given in the same way. After the sixth dose an intermission of twelve hours should be allowed in all cases.

Steam in the room, keeping the air moist, is very effective in reducing the severity of the paroxysms. An Arnold steam atomizer is very efficient for this purpose. Steam medicated with creosote and turpentine was used, but it is doubtful whether it is any more effective. It is often said that children do not cough so much while they are out in the air. Mothers of the poorer class are apt to tell the doctor that the children do not cough on their way to and from the gas-tank, the gases from which are supposed to be good for the disease, the children being brought there every day. Because of the fact that it takes the children out into the air the gas-tank treatment should be encouraged. The paroxysms are usually worse at night. The cause of this is often the want of fresh air. The remedies that surely do good in whooping-cough are the sedatives and fresh air. It must be remembered that patients become accustomed to any drug and a change may be required.

Antiseptics in Whooping-Cough.—In the discussion Dr. S. H. Dessau insisted on the value of antiseptics in the treatment of whooping-cough. The disease is due to a specific germ and it is to be expected that an antiseptic is indicated. The paroxysms partake besides of a nervous explosion so that a sedative would seem to be indicated. Chloral besides being a sedative is a good internal antiseptic. For a number of years Dr. Dessau employed the drug rather freely, but stopped using it because it is a most nauseous prepara-

tion. Undoubtedly antipyrin owes some of its value as a remedy for whooping-cough to the fact that it is an antiseptic as well as a sedative. Recently in Germany a new remedy has been employed which is also an antiseptic, *viz.*, difluordiphenyl. It is used by inunction, a five per cent. ointment of lanoline and vasoline being rubbed into the chest and back after a free cleansing by sapo viridis. Benefit is claimed from this treatment after two days and cure in two weeks. Some time ago Cadet Gassicourt suggested that the whoop of pertussis might be due to enlarged mediastinal glands pressing upon the recurrent laryngeal nerve. He attributed the enlargement of the glands to the presence of tubercle bacilli. There seems no doubt that there are cases in which the whooping-cough is really due to such a condition as Gassicourt describes. In these cases belladonna and potassium iodide are valuable.

Dr. G. M. Swift said that the value of antiseptics in the treatment of whooping-cough has been impressed upon him of late. The air of the room in which the little patients are confined can be rendered medicinal in its effect by keeping a 25 per cent. solution of formalin constantly exposed in an open vessel. This is quite sufficient to make the odor of the drug noticeable in the room. This same expedient is useful in influenza. For the treatment of whooping-cough fresh air is of the greatest importance. There are undoubtedly some cases in which the mediastinal glands are demonstrably enlarged and in which this enlargement has something to do with the paroxysmal cough. In these cases an abundance of fresh air is a most useful remedy. Dr. Swift has a prejudice against the coal-tar products, although at times he has seen some good come from phenacetine. He has seen good effects from heroin in a certain number of cases and has been pleased with its action. It seems to replace codeine very advantageously although, of course, its real value is not yet decided.

Dr. J. J. Walsh said that it is a tradition in the mining districts of Pennsylvania that the air of the mines is good for whooping-cough. In order that children may have the opportunity to breathe it they are taken down in the mines for some hours several times a week. The custom has practically been discontinued of late years, because medical men scoffed at the idea. As a matter of fact it is very probable that the fresh air that the children enjoyed during their excursion to and from the mines, together with the hour in the mild, equable temperature of the mines, which is never above 70° F. and never below 60° F., was not without its effect. Dr. Walsh mentioned that a series of cases had been treated recently by serum taken from individuals who had had whooping-cough. It is well known that whooping-cough protects very well against second attacks for years after a first attack of the disease. It is to be presumed, then, that according to modern ideas of immunity the serum of a person who has recovered from an attack of the disease contains for life certain properties which make it efficient against the germ of the disease, for whooping-cough is undoubtedly a germ disease. This fact of immunity was taken advantage of in some recent experiments for the treatment of the disease. When injected into children suffering from whooping-cough this had the effect in two cases of aborting the disease and in others of lessening the number and severity of the paroxysms. The subject is as yet under investigation and the experiments have not been definitely published.

Dr. Hermann said that for the past two years Dr. Koplik has found the sedative coal-tar products, especially antipyrin, of the most use in the treatment of whooping-cough. It is given to a child of two years in two-grain doses guarded by a drop dose of digitalis.

Dr. Walter Lester Carr said that the most satisfactory remedy for whooping-cough seemed to be antipyrin with codeine. Codeine has not been replaced in his experience by heroin. Quinine is good mainly because it acts as a tonic. Fresh air is extremely important and the children's playroom should be freely aired and its windows kept open practically all the time. It is not alone the paroxysms of whooping-cough that must be treated, but the while mucous membrane of the patient. If adenoids and hypertrophied tonsils exist they should be seen to early in the case. In a word, it is the patient and not the whooping-cough which must be treated.

Dr. Berg said that whooping-cough has two indications for treatment: First, the convulsion, and, secondly, the softening of the tough glairy mucus which makes the paroxysms persistent. For the convulsion, just as for epilepsy, the bromides are the best drugs. For the softening of the tough secretion bichloride of mercury is very effective. Years ago before the introduction of the antitoxin method of treating diphtheria most practitioners had favorable experience with the success of the soluble preparations of mercury in causing the disappearance of throat secretions and membranous deposits. It will do this in whooping-cough also. One-sixtieth of a grain may be given every three hours to a child until diarrhea occurs, then intermitted for several days and taken up once more when the child's stools have become normal in number and amount. Under this treatment complications by severe bronchitis or pneumonia are very rare.

THE NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, Held Thursday, February 15, 1900.

The President, Wm. H. Thomson, M.D., in the Chair.

THE business of the evening consisted of a discussion on the etiology of cancer as far as light had been thrown upon that important subject by the work of the past year in the New York State

Laboratory for the Investigation of the Cause of Cancer at Buffalo.

Cancer Etiology.—Dr. Roswell Park said that his remarks on this subject at the present meeting were but a supplement to a paper that was read before the New York State Medical Society at its recent meeting in Albany. (See p. 324.)

Karyokinesis, he said, is not now looked upon as so important a feature of cancer as it formerly was. Arnold has called attention to the fact that fragmentation takes place in portions of a malignant tumor and that this seems to be characteristic of certain grades of malignancy. A Japanese pathologist, however, considers that this fragmentation is a post-mortem change; Klebs has recently called renewed attention to leucocytic inclusion in cancer. In this respect cancers are comparable to the infectious granulomata. It would seem that this inclusion was due to phagocytosis and supposes the presence of parasites.

The question of metastasis continues to be a most interesting one. Each metastasis is really to be considered as an autoinfection. Under varying circumstances metastases are very specific in character. From certain organs they almost invariably take place in certain definite tissues and not in others. Von Rechlinghausen pointed out a good while ago that metastasis from cancer of the prostate is practically always to be found in bone. While metastasis from cancer very seldom takes place in the lungs that from sarcoma is quite frequent. It occurs by means of retrograde venous embolism or by direct infection from particles in the venous blood stream.

Conveyance of Cancer.—Certain forms of communication of cancer are very familiar. That it may pass from one lip to another has long been well known. In recent years we have learned that one vocal chord may infect the other. Cases of communication of cancer from the eyelid to the globe of the eye have been reported. In a number of cases we know that a carcinoma of one wall of the bladder has led to infection of the opposite wall from the two surfaces lying in contact. The same thing happens with regard to the stomach. A still more notable example of cancer infection is when cancer develops in the stomach from the swallowing of portions of cancer tissue from a cancer focus higher up in the esophagus. A striking case has been reported recently in which a patient who had cancer of the ear scratched it and thus infected his lip. Cancer of the lung from cancer of the larynx has been reported and is evidently due to the same process as leads to the infection of the stomach from the esophagus.

Vitality of Epithelial Cells.—The epithelial cells in cancer not only retain their vitality to be carried from one part of the body to another, but seem to retain it for some time after removal from the body under favorable conditions, as in serous fluids and the like. The failure even by the most distinguished experimenters to inoculate cancer only shows that the methods thus far employed have been wrong. It does not inevitably lead to the conclusion that we will never be able to solve the mystery of cancer infection. There are certainly some cases on record in which cancer has been conveyed to animals. A number of cases in human beings show that the persistent irritation of epithelial cells with opportunities for infection may lead to the development of cancer. Cases are frequent in medical literature in which cancer has developed in the scar of lupus vulgaris. It does not develop after lupus erythematosus. It frequently develops in fistulous tracts, especially fistulous tracts leading inward, as down to a necrotic focus in bone disease. It develops not infrequently in urethral fistulæ. The scars of burns are in the same way frequently the site of cancer.

Irritation and Cancer Development.—Volkmann found that out of 126 cases of cancer of the limbs 99 were due to irritation. The well-known effect of irritation in producing cancers around the mouth needs scarcely be mentioned. Jagged teeth, the presence of tartar, the use of tobacco, all have been set down seemingly with good reason as predisposing causes of cancer. Debove reported cancer of the tongue in 24 cases out of 25 cases of psoriasis that he had had under observation. The process recalls vividly Paget's disease of the nipple and the liability to cancer that follows it. Cancer of the genital organs is also frequently due to chronic irritation. Psoriasis uterina has been reported as preceding cancer of the body of the uterus. Cervical cancer follows the use of a pessary or occurs in the scar of a laceration of the cervix or at the site of an old ulcer. Cancer of the bladder occurs after a vesical calculus and cancers of various parts of the urinary tract have been traced to the irritation of calculi at various points in the kidney and its pelvis. Biliary lithiasis is undoubtedly at least a predisposing cause of cancer of the gall-passages. Epithelioma has been reported as developing in the wall of a cavity in the lung and in the indurated tissue around a tracheotomy tube. Endotheliomata have occurred with great frequency among the workers at Schneeberg in the cobalt mines. It occurs in the lungs from inhalation of the irritating metal dust of the mines.

Cancer Dyscrasia and Cachexia.—Cancer dyscrasia often precedes the development of cancer. It has often erroneously been thought to be a consequence of its initial steps. It would seem, however, that the system gets into a condition in which the development of cancer is favored by the lowered nutrition of the patient. The condition cannot be described as accurately as can the tuberculous dyscrasia, but it undoubtedly exists. Cancer dyscrasia and cachexia must not be confounded. The cachexia develops as a consequence of the drain upon the system by the growth of the tumor and by the absorption from it of certain toxic substances that disturb systemic metabolism. The injection of cancer juice into animals always produces serious results; fever develops, salivation occurs, and collapse closes the scene. There is undoubtedly great toxicity

in cancer serum. Coma has been known to develop in a number of cases in which there was rapid softening of the cancer with absorption from the tumor of a considerable amount of cancerous elements. This coma is not unlike the similar condition which develops as the result of diabetes mellitus. Klemperer has reported the discovery in the blood of cancer patients of oxybutyric acid which is thought also to be the important element in the production of diabetic coma.

Cause of Cancer.—Dr. Gaylord said that the most important work on the etiology of cancer in recent years has come from the Italian school. The daily press gave a good deal of space not long ago to the work of a Frenchman who reported that he had discovered the cause of cancer. He was undoubtedly only a charlatan, however, and his supposed specimen of the cause of cancer proved to be nothing more than a very ordinary form of rose yeast. His cancer serum was a fraud.

Blastomycetes in Cancer.—The most important studies in the etiology of cancer at present are those that concern themselves with the blastomycetes or yeasts. Their possible connection with cancer was first suggested by Roncali, who, while studying certain appearances that were supposed to be coccidia, recognized that they were yeasts. Before this Russell of Edinburgh had pointed out the almost invariable presence in cancer of certain "fuchsin bodies," so called because they stain deeply with fuchsin. Russell thought that they were the cause of cancer. Fuchsin, however, stains a good many other things besides these bodies, and so it was not long before Russell's work on the subject was discredited by the observations of others. Russell was not, however, altogether wrong. The problem is not one that can be decided by morphology alone. The microscope is not sufficient to decide and we shall not know definitely until we are able to tell something more of the internal structure and mode of development of these bodies. Later on Ruffer and Walker and then Ruffer and Plimmer made similar discoveries. Plimmer found in 1100 out of 1200 cases of cancer a typical body that he considers a parasite. He did not succeed in inoculating this into animals. The body seems to be a blastomyces.

English and Italian Observations.—San Felice, who accepted Roncali's suggestion as to the possibility of blastomyces being the cause of cancer, has done considerable work on the subject. He has lately succeeded in producing by the inoculation of saccharomyces local tumors followed by enlargement of the lymph nodes. These lymph nodes were allowed to dry and when pulverized and inoculated into successive animals they became more and more virulent until finally they produced death in two days. The inoculation of this virulent material produced in one animal true adenocarcinoma of the breast. From this, however, the organism could not be cultivated, but it could be found in the tissues although in slightly modified form. It had become changed into something that was very like the Russell fuchsin bodies. San Felice succeeded in producing one cancer besides a series of other tumors. The latter were not typical of any single class, although one of them looked very much like a sarcoma. The possibility of the cultivation of the blastomyces from these tumors was very variable and seemed to follow no definite rule.

Pathogenic Yeasts.—Very little is known of the pathogeniety of yeasts. Busse in 1893 first showed that yeasts could be pathogenic for man. They occur mostly in skin lesions. The place of yeasts in botany is rather indefinite. Brefield unsettled the botanical world some time ago by announcing that a plant which grew in one cycle of its existence as a fungus, he had observed to grow in another cycle as a yeast. We have no way of classifying yeasts morphologically and the whole subject is extremely obscure. It is clear then that their possible connection with cancer can not be definitely made out for some time to come. We have evidence now which seems to demonstrate that the appearances found in epithelial cells in many cases of cancer are not due to degeneration products within the cells, but are due to something living, and the theory of coccidia is giving way to that of blastomyces.

Results at Buffalo.—We have tried cultivations of every possible kind in the State Laboratory for the Investigation of Cancer. Altogether 1200 cultures have been made on 60 different culture media. The result has been most variable. Only once did we find a yeast in pure culture. Only once was inoculation performed successfully. Since a recent visit to Europe we have taken advantage of the technic employed by San Felice in his recent observations. We now use aseptic material from dried lymph nodes for our inoculations. The work has been done only within this last two months, yet three times death has occurred within three weeks after inoculation. In certain of the cases we have found Russell's bodies present in the nodules which occurred in consequence of the inoculation.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

GENERAL AND LOCAL ANESTHESIA. By Dr. Aimè Paul Heineck. Demy. 8vo., 124 pages. G. P. Engelhard & Co., Chicago.

PROCEEDINGS OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION, at the Fifty-fourth Annual Meeting, held in St. Louis, May 10-13, 1898.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. For the Use of Students and Practitioners. By Drs. James Nevins Hyde and Franklin Hugh Montgomery. 8vo., 864 pages. Illustrated. Lea Brothers & Co., Philadelphia and New York. $4.50.

HEALTHY EXERCISE. In three parts. By Dr. Robert H. Greene. 16mo., 167 pages. Illustrated. Harper & Brothers, New York and London.